THE IRON TRADE REVIEW

Volume LIII CLEVELAND, SEPTEMBER 25, 1913 *No. 13*

Building a Four-Tube Steel Tunnel in Sections

Details of the Construction Work of the Harlem River Tunnel Carried on by the Hoff System—How the Sections Are Lowered Into the Channel

The construction of the steel tunnel under the Harlem river at 131st street, New York City, is being carried out in an exceedingly curious manner. Long sections of riveted steel plate cylinders are being submerged in the bottom of the river, and these, when finally joined together, end to end, will form a nest of four tubes through which will be laid the tracks of the extended Lexington avenue subway line, connecting the boroughs of Manhattan and the Bronx. These sections are being riveted together on land some distance from the point where they will be submerged, and towed to the designated spot in the river, where they are sunk into position.

The system of construction is known as the Hoff or Detroit method, deriving its name from that of the designer and patentee, Olaf Hoff, consulting engineer, 145 Broadway, New York City, and also from its original application at Detroit for building a tunnel under the Detroit river for the Michigan Central railroad. The present work constitutes its first application in the east. The Detroit tunnel consisted of two tubes only, whereas four tubes will extend under the Harlem river. The former, however, are of considerably greater length than those now building.

The steel tubes are built of rolled plates of tank quality, 3/8 inch in thickness. The material, punched and curved, is shipped to the contractors from the Ambridge, Pa., plant of the American Bridge Co. The sections, consisting of four tubes each, are riveted together, one at a time, upon false work in a slip of the river at 152nd street. The tubes are 19 feet in diameter. Four of the sections are to be 220 feet long, and the fifth, 200 feet in length, making the total length

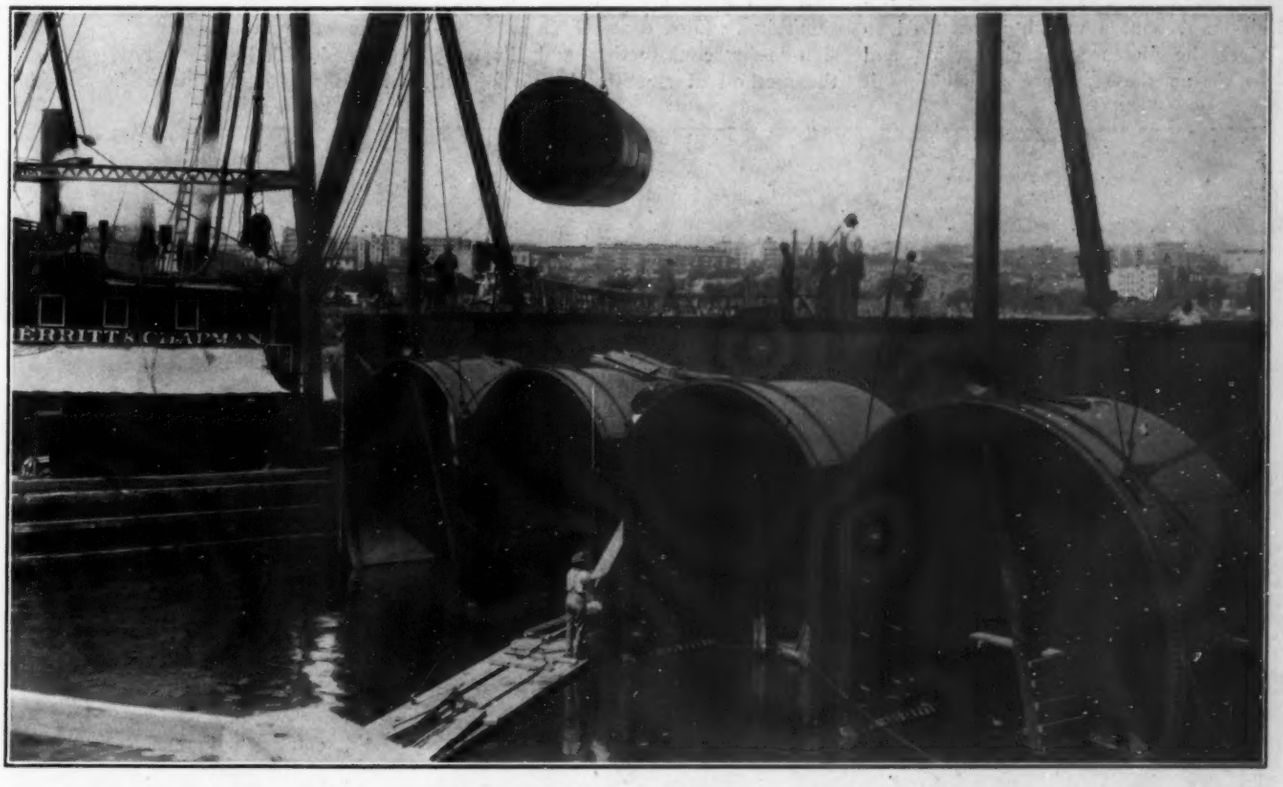


FIG. 1—ONE OF THE STEEL TUBE SECTIONS, SHOWING THE WOOD BULKHEADS AND ONE-HALF OF AN AIR CYLINDER BEING LOWERED INTO POSITION. THE SOCKETS BY WHICH THE SECTIONS ARE CONNECTED WITH PINS ARE SHOWN AT THE BOTTOMS OF THE MASTS

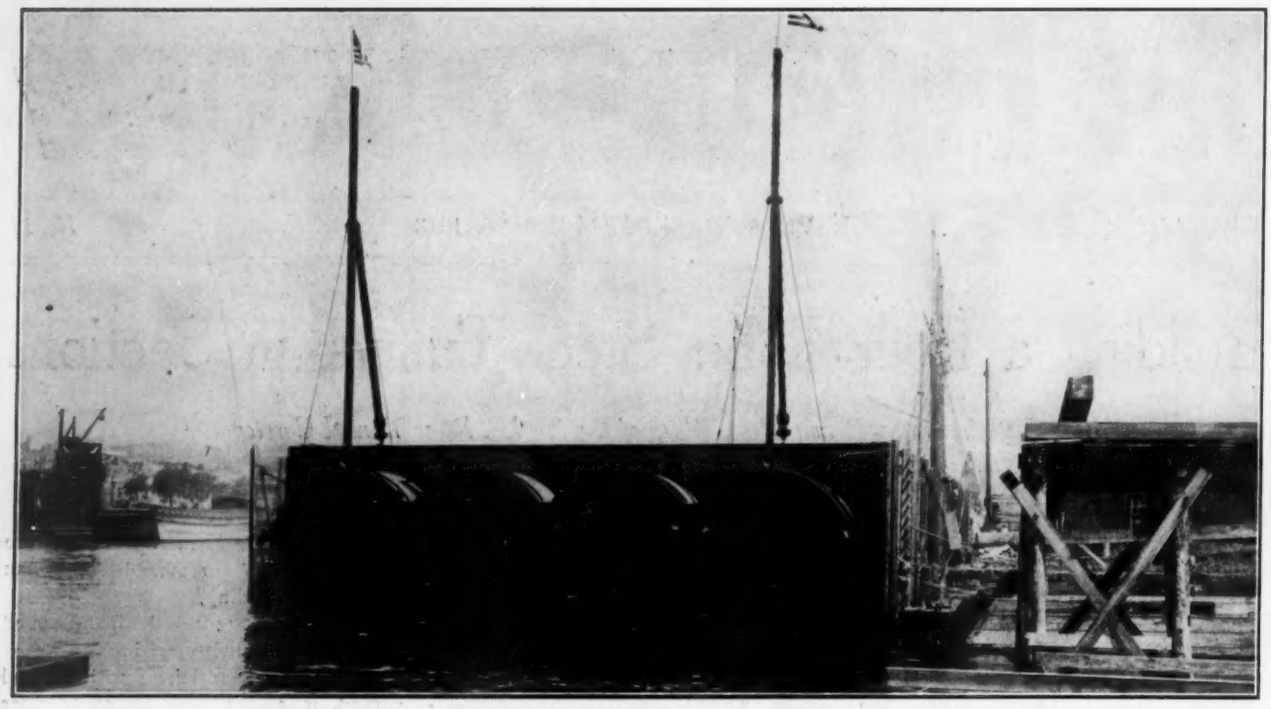


FIG. 2—ONE OF THE COMPLETED SECTIONS BEFORE THE AIR CYLINDERS WERE PLACED IN POSITION

of the four-track tunnel, 1,080 feet. About 3,200 tons of steel plates will be required for the completed tunnel. The first of the five sections was successfully lowered to its berth a few days ago, and a second section has been towed to the excavation for the tunnel and now is being placed in position. About a month is required to rivet the plates for each section and to rig up the structure for floating it down stream. As the four cylinders are riveted in parallel, they are spaced 2 feet apart by steel partition walls or diaphragms, constructed of ¼-inch plates. These diaphragms also extend over and under the tubes and bind them together to form one section. The two sides are enclosed in wood sheathing. Figs. 6 and 7 show a section under construction and illustrate the method of riveting the plates and the steel diaphragms around the tubes. In Fig. 7, the method of building the wood on the sides of the tubes is shown clearly. Temporary wooden bulkheads then are fitted in the ends of the tubes, which enable them to be floated down the river to the point where they are to be submerged.

The two outside bulkheads are equipped with 12-inch valves which admit water to the tubes to facilitate

FIG. 3—ONE OF THE STEEL SECTIONS BEING TOWED DOWN THE RIVER

FIG. 4—STEEL SECTION ANCHORED BEFORE LOWERING. THE AIR CYLINDERS ARE CLEARLY SHOWN

sinking the section. Superimposed upon each section are four air cylinders, 15 feet, 6 inches in diameter and 65 feet long. These cylinders are placed in a transverse position, two at the front and two at the rear of the section. They are used to control the sinking of the section and to hold it suspended under water while it is being lowered into the trench. Fig. 1 shows one-half of an air cylinder being lowered upon the section. This view also shows the wood end bulkheads in the different cylinders. The built-up mass of steel tubes superimposed by four air cylinders, forming a huge steel raft, is then ready for floating. The outside dimensions of the floating structure were as follows: 220 feet long, 76 feet wide and 24 feet, 6 inches high from the bottom to the top of the diaphragms. The transportation of these tubes, a mile down the Harlem river, from 152nd street to 131st street, was one of the most interesting features of the work recently completed. To release the riveted section from the false work in the slip, nine flat boats were used. These were forced under

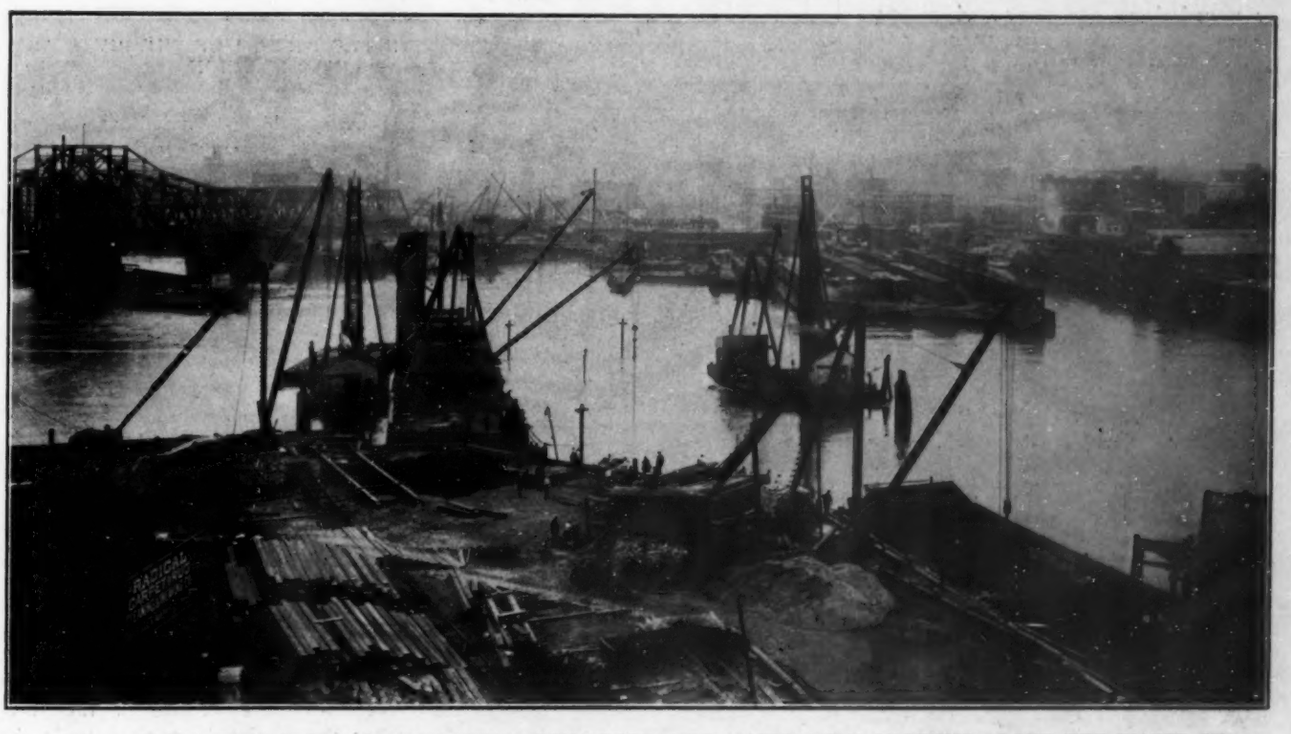


FIG. 5—STEEL TUBE SECTION COMPLETELY SUBMERGED, THE MASTS ONLY SHOWING ABOVE THE WATER TO INDICATE THE ALIGNMENT OF THE SECTION IN THE TRENCH

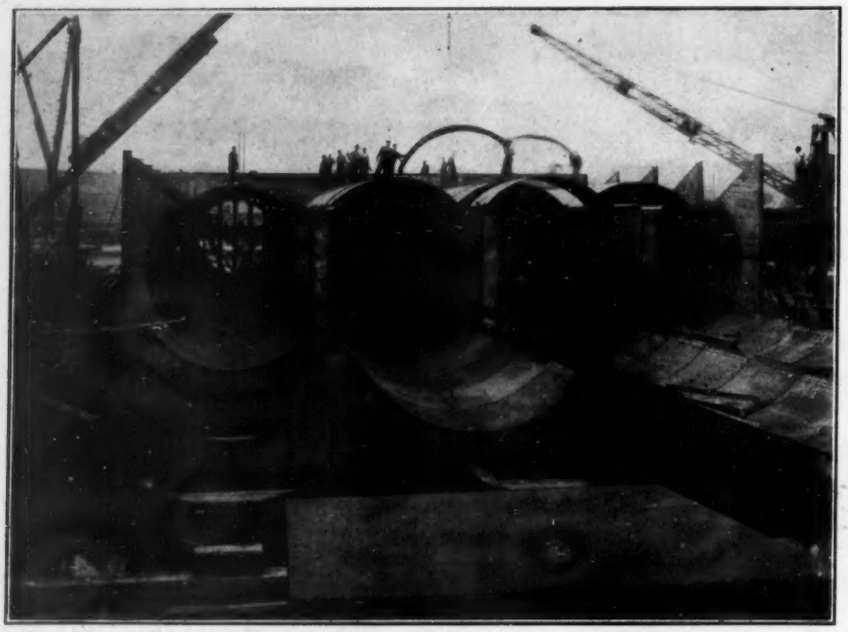


FIG. 6—ONE OF THE STEEL SECTIONS UNDER CONSTRUCTION, WHICH ILLUSTRATES THE USE OF STEEL DIAPHRAGMS AROUND THE TUBES

the tubes at low tide. As the tide rose, the boats lifted the section from its mooring. The flat boats floated the section into midstream and then were scuttled, permitting the section of four steel tubes to settle gently in the river and to float on its own bottom. The wood bulkheads in the ends of the tubes made it possible to float the mass.

With two tugs pulling and one guiding at the rear, the section was slowly towed down the river and in two hours had reached the tunnel site. Here it was moored above the trench in the bottom of the river, which had been excavated to receive it. This trench was dug in the bottom of the river to a depth of about 58 feet below mean high tide. It has a width of about 80 feet at the bottom and has sloping sides similar to a railroad cut. The trench was excavated with a clamshell dredge. A cross-section of the tunnel, showing the subaqueous excavation, is illustrated in Fig. 8.

When sinking the tubes, provision had to be made to control their gradual descent to the river bottom and to prevent pitching when the point of buoyancy had disappeared. To facilitate this, the valves in the bulkheads of the tubes and the four air cylinders, were provided, the latter having sufficient buoyancy to hold the section suspended in the water when submerged.

To facilitate lowering the steel section, the bulkhead valves were opened and water was admitted to the tubes. The section was gradually submerged,

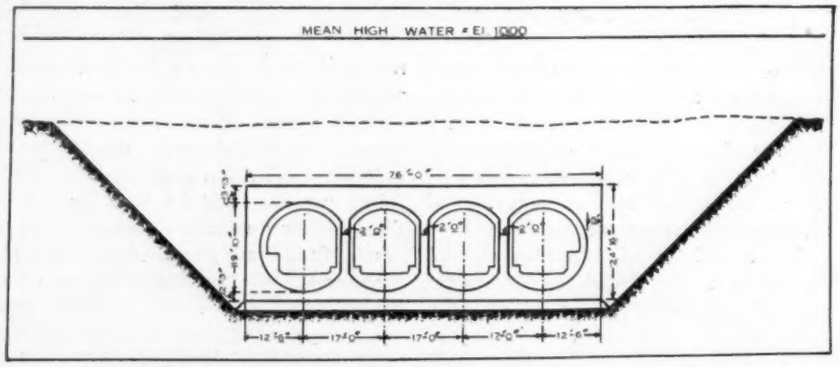


FIG. 8—CROSS-SECTION OF THE TRENCH IN THE BOTTOM OF THE RIVER AND THE FOUR TUBES IN THEIR FINAL POSITION

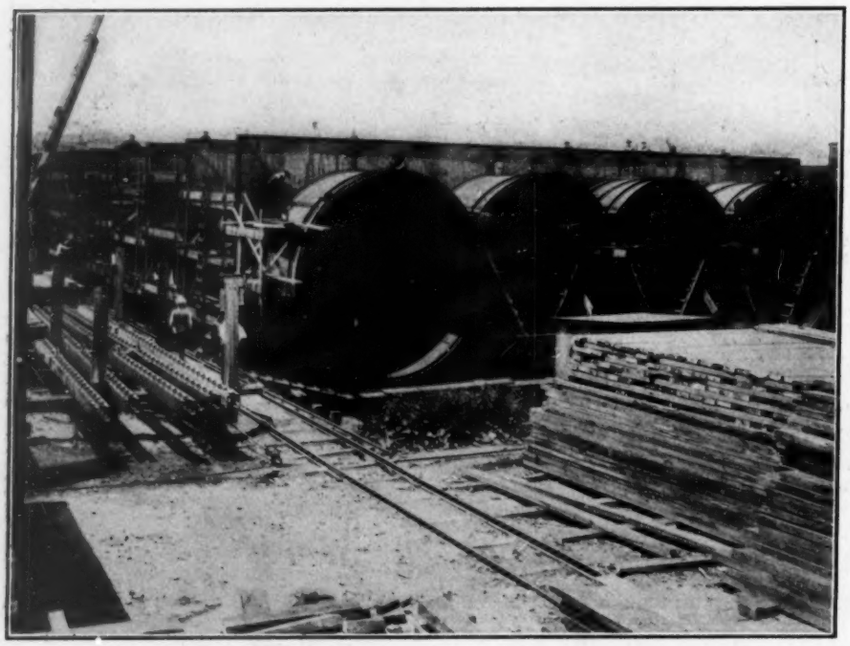


FIG. 7—ONE OF THE STEEL SECTIONS NEARING COMPLETION, WHICH SHOWS THE CONSTRUCTION OF THE WOOD SHEATHING ENCLOSING THE SIDES

but was held suspended above the bottom of the trench by the buoyancy of the air cylinders. To facilitate the final lowering of the steel section, sufficient water was admitted to the cylinder to overcome this buoyancy. The floating derricks, one at each end of the section, then completed the lowering operation. In effecting this, they supported the full load. In the bottom of the trench, two wood pile benches were built and the section was lowered so that its ends rested upon these supports. These benches are tapped with 12-inch steel channels and extend about 2 feet above the bottom of the trench. The correct alignment and true grade of the section in the bottom of the river, was obtained by four steel masts attached to the ends of the outside tubes. These extend from 10 to 15 feet above the surface of the river when the section is in position in the trench. The ends of these masts protruding above the surface of the water

are shown in Fig. 5. Fig. 1 is a near view of the masts and shows how they are attached to the tubes. The space between the bottom of the steel section and the bottom of the trench next were filled with concrete, firmly fixing the tubes in their proper position. After the tubes were finally in place, the air cylinders were removed and this process will be repeated with each section until the entire tunnel is in place.

The partition walls or diaphragms separating the four tubes, with the wood sheathing along the sides, represent a form of construction divided into a series of pockets or compartments, and into these pockets the concrete is poured. The bottom of the tunnel serves as the bottom of the form and the concrete is conveyed through pipes extending from a point above the surface of the water to the bottom of the trench. These pipes are called tremies and are provided with hoppers at their upper ends into which the concrete is poured. The tremie scow at work is shown in Fig. 5. The concrete displaces the water in the pipes and slowly oozes out at the bottom. As rapidly as it is discharged at the bottom, it is replaced at the top, the process being continuous until the pocket is filled. In this manner, the section is encased, pocket after pocket, until the concreting is completed. The filling of each pocket with concrete requires about a day. The next section then is lowered into position and after being connected to the first, it is encased in concrete.

The respective sections of the tunnels are bolted together by a special joint. Steel driving pins form a part of special castings which are bolted to the top circumferences of the two side tubes of one section. Upon corresponding positions on the side tubes of the adjoining sections are attached steel castings, each containing a deep socket, shown in Fig. 1. When a new section is lowered into the excavation adjoining the section already in place, a diver adjusts the driving pins in the sockets. The new section then is drawn flush to the preceding section by a cable and the pins are inserted in the sockets. Around the outside circumference of the four tubes small angles are bolted, forming flanges engaging corresponding flanges on the tubes of the adjoining section. The flanges are bolted together by divers. To the inside circumferences of the tubes Z-bars are bolted which engage corresponding Z-bars in the adjoining tubes. To the surface formed by these bars a plate is riveted, completing the joint. The arrangement of the extension angles and the entering Z-bars is illustrated in Fig. 1.

When all sections have been lowered into position and are connected, the water will be pumped out of them and the tubes will be lined with concrete. The contractors in charge of building the Harlem river tunnel are Mr. Hoff and Arthur McMullen, of New York City.

The Use of Machines in Underground Mining[1]

By H E Martin and W J Kaiser

The application of machines to underground mining on the Mesabi range is a radical departure from the methods in use at the present time, and while it is difficult to foretell the ultimate results, their use cannot but be beneficial both to the miner and the mining companies.

Since mining was started on the Mesabi range some 20 odd years ago, improvements and changes have been made in practically every method and device except those used in the actual mining of underground ore. During the past few years open-pit mining has grown from a comparative infant to its present huge proportions. Heavier steam shovels, larger engines and standard equipment have been adopted, as well as various changes in methods employed. In our underground mines, the most efficient machinery has been installed for handling the ore once it has left the miners' hands. The miners, however, still drill by hand, muck their own dirt and otherwise mine as they have done for years.

How to increase the production, using the limited number of miners available, is the question of vital interest. If power machines be successfully used, it would necessarily mean a division of labor into two classes, miners and muckers, and the output per miner would be largely increased. The common laborers, becoming more proficient, would eventually graduate into the miners' class, thus increasing their number. With these ideas in view, it was decided to experiment with machines on the soft ores of this range.

As used at the Harold mine, of the Hibbing district, the machines consist of an ordinary Sullivan air pick or coal puncher, and a Jeffries air auger. The pick machine is the largest type manufactured by the Sullivan Machinery Co., having a depth of undercut of 5½ feet. The bore of cylinder is 5⅛ inches, pressure required 80 pounds, and total weight, 825 pounds. To understand thoroughly the application of these machines to our mining methods, it may be well to mention first the several operations incident to taking out a set of ground by ordinary means. The miners first drill a round of holes in the breast, each hole approximately 5 feet in depth and varying in number from three to five, depending upon the height of post, character of ground and whether drifting into the solid or alongside of caved ground. The upper holes usually are fired first and the bottom holes after the top dirt has been mucked out. The amount of dynamite used depends upon the conditions mentioned, and varies from 15 to 30 sticks, each stick being about ½ pound. After the upper holes are fired the miners secure the back by poling from the last set of timber into the breast. The ore broken in this blast is then loaded and trammed, and the bottom holes are fired. After all the ore is mucked out, the miners trim the breast, back and sides and the set is ready for timber.

Under ordinary conditions the amount of time spent in these several operations is approximately as follows:

Drilling, 17 per cent; blasting, 4 per cent; clearing of smoke, 3 per cent; tramming, 7 per cent; trimming, 9 per cent; timbering, 20 per cent, and mucking, 40 per cent.

The number of men required for one machine crew, is two machine men, three miners and six muckers. This ratio was experimentally determined and is of the most importance to the efficient working of the machines, in that there should be no delay of miners, muckers or machine men waiting upon each other. The minimum num-

[1]Presented at the annual meeting of the Lake Superior Mining Institute.

ber of working places or rooms required to take care of one machine has been found to be five.

The actual taking out of a set of ground with the aid of the machines is as follows:

The set is first under-cut with the puncher to a depth of 5 feet, the cut extending from the solid rib to within 6 inches or so of the opposite side, thus leaving a small pillar 6 inches wide and the full length of the set. The purpose of this small pillar is to support the ground against premature caving. Two holes are then drilled with the air auger, about 1 foot from the solid rib and spaced 2 and 6 feet, respectively, from the back. In case the slice was driven into the solid, four holes would be necessary, two on each side. Two short holes are drilled in the small pillar supporting the set by the miners. Boards are next placed in the cut and under the set to be broken out, a small amount of ore picked down upon them to hold them in place, and the holes are loaded and fired. Being able to place boards beneath the set before it is broken, is an advantage rather hard to estimate, but of considerable moment to those using the shovels, giving them as it does a smooth surface from which to shovel. The miners then secure the back by poling and the room is ready for the muckers. After the ore is mucked-out, the miners square up the set, place the timber and another cycle of operations is started.

The average time for undercutting one set of ground excluding delays, has been 59 minutes, for moving from place to place and setting machine, 26 minutes. To drill 1 foot of ground with the air auger has averaged 2.8 minutes, and the time setting-up, 1.4 minutes per foot. These results can and no doubt will be considerably lessened, as the machine men become more proficient.

The advantages which can be claimed for the machine, aside from any possible reduction in the cost of producing the ore, are employment of one-half common labor, using approximately one-half the amount of dynamite, less liability of posts being blasted out and consequent caving of rooms, and always have a smooth surface to shovel from. To the successful working of the machines, several conditions are necessary. The rooms served by the machine must be easy of access from one to another, their height should not be less than 7 or 8 feet and no bottom stoping should be necessary. In other words they can be applied to ordinary slicing and square setting.

The results obtained so far have not been as satisfactory as could be desired, primarily due to the labor situation, muckers not being obtainable in sufficient number to keep the machine and miners busy at all times. At the start many delays were occasioned by not having a sufficient number of places opened up for the machine. However, during the first five weeks of work, the average number of tons per man per day was 12, an amount considerably above the average for most places in our underground mines. Taking these points into consideration, it can be conservatively said, that it is not a question of what the machines can or will do but merely one of organization, and hence their future on the Mesabi range seems assured.

Self-Contained Clam Shell Bucket

For handling sand in foundries and for other similar industrial purposes, the Euclid Crane & Hoist Co., Euclid, O., has designed a self-contained clam-shell bucket which can be suspended from any hoist or crane of sufficient capacity to lift the loaded bucket and to carry it from one point in the shop to another. As shown in Figs. 1 and 2, an electrically-operated hoist is supported by a structural steel frame work, to which the operating arms of the bucket are attached. The electric hoist is of the standard type built by the Euclid Crane & Hoist Co., and the motor is protected by an automatic slip clutch and cut-out. The bucket is of the single line type and is designed for suspension from any standard crane having only one hoist hook. The hoist opens and closes the bucket and the crane from which this bucket is suspended lifts the latter with its load. The bucket, therefore, is self-contained, being provided with its own mechanism for opening and closing, and is ready for operation when suspended from a crane or hoist hook. The entire hoisting apparatus and electrical connections are protected in such a way that they are not injured by rough handling.

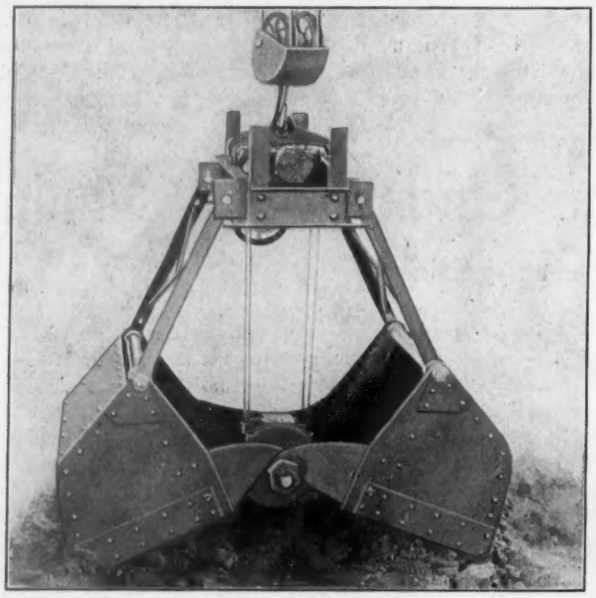


FIG. 1—SELF-CONTAINED CLAM-SHELL BUCKET IN OPEN POSITION

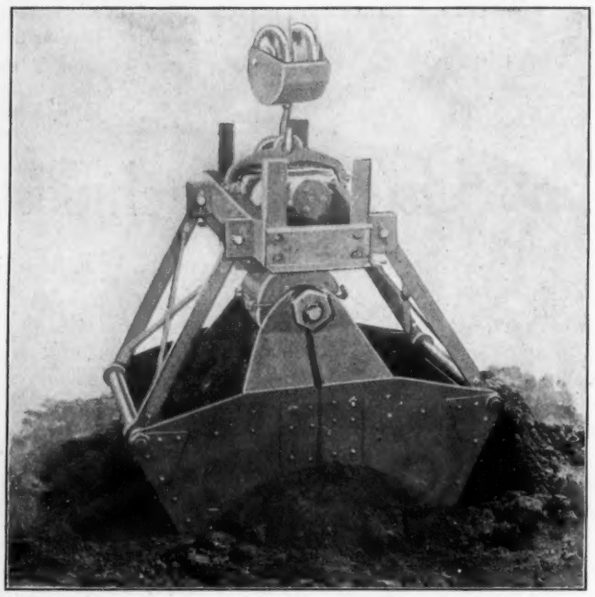
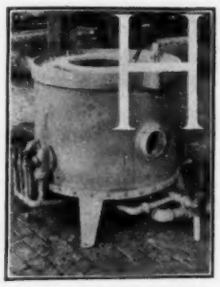


FIG. 2—SELF-CONTAINED CLAM-SHELL BUCKET CLOSED

A Commercial Plant for Heat-Treating Steel

How the Steel Improvement Co. Has Equipped Its Works to Meet the Exacting Requirements of Users of High Grade Steel



HEAT-TREATING crystalline, low-carbon steels to refine their structure has become an important adjunct of the modern processes of steel-making. The number of plants equipped with facilities for refining steel through the application of high temperatures, has increased rapidly during the past few years and recent advances in heat-treating have lifted it from the embryonic stages of a few decades ago and brought it proper recognition.

The introduction of chemistry into steelmaking was viewed with skepticism by the old-time furnaceman, who was content to rely upon his wonderfully trained eye. However, the new process won its way by practical demonstrations of the beneficent results obtained through the scientific treatment of steel. The natural corollary of improving the steel structure, and as a consequence, its properties, by a more accurate knowledge of the effects of the chemical components, is the determination of the effects of heat upon these metals and farther, upon the avidity as that of the chemistry of steelmaking, partly due to the fact that the former is still a comparatively modern development. When one considers that there are more than 300 different combinations of alloys of steel, each of which has six critical temperatures, and that the addition of any metal may affect some or all of these critical points, the desire of the steelmaker to further broaden his knowledge of heat-treating, is readily understood.

FIG. 2—THE LARGE HEAT-TREATING FURNACES, SMALL OIL QUENCHING TANK, WATER TANK AND BLOWER

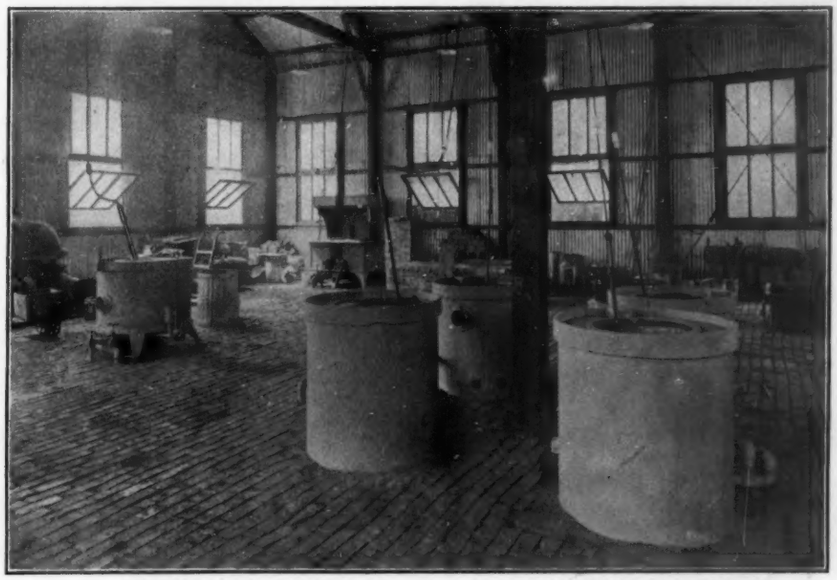


FIG. 1—THE LEAD AND CYANIDE FURNACES ARE IN THE FOREGROUND AND THE OIL AND LEAD-DRAWING FURNACES ARE IN THE REAR. THE PYROMETER ATTACHMENTS ARE CLEARLY SHOWN

finished product. Investigation along this line of scientific heat-treating has not been pursued with the same

Case-hardening, or the development of a hard, better wearing skin or surface on the tool or metal part, has been studied and brought to varying stages of efficiency, depending largely upon the use for which the part under treatment is intended. The case-hardening process consists of the introduction of carbon into the surface of a metal part, the carburization imparting a hard skin, but causing little or no change in the physical structure of the core.

The student of scientific heat-treating goes farther and aims to build up the center as well as the surface of the metal being used, in order to develop the maximum properties of that type of steel. He takes a low-carbon steel, highly crystalline, and through his knowledge of the effects of subjecting that grade of steel to certain temperatures, transforms the core to a close-grained, homogeneous metal. The overlying layer responds to a second treatment and is further refined. The skin, or surface, in turn receives the treatment necessary to convert it into tool steel quality.

Although the study of heat-treating has advanced to a stage where a department for such work is a part of many modern plants, the number of companies engaged in heat-treating

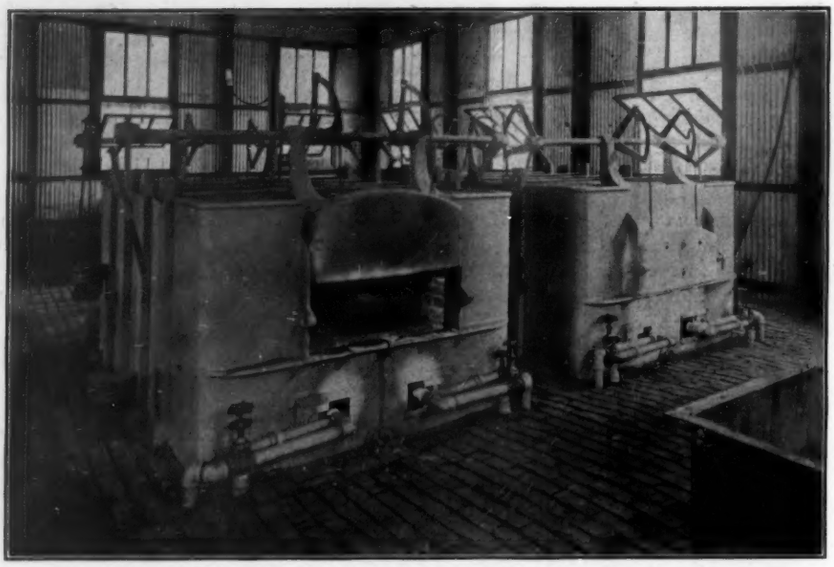


FIG. 3—A NEAR VIEW OF THE HEAT-TREATING FURNACES, SHOWING ONE BEING CHARGED

alone, is small. The latest addition to the ranks of exclusive heat-treating concerns is the Steel Improvement Co., Windsor avenue N. E., Cleveland, whose plant has just been placed in operation.

The company has had the assistance and advice of R. R. Abbott, a former instructor at the Case School of Applied Science, Cleveland, and a metallurgical engineer of note, who in the course of an investigation, covering a period of eight years, has developed a satisfactory, scientific treatment of modern alloys of steel. Results obtained by Mr. Abbott in increasing the efficiency of low-carbon steels have been highly satisfactory in a number of instances, and it was this belief that tool steel or its equal could be made from cheaper materials than those now used, that led to the organization of the Steel Improvement Co.

Fifteen Types of Steel Treated

The company aims by applying the knowledge of the critical ranges of each steel, to secure a tough, fibrous core and a hard wearing surface, which not only will produce a tool steel quality from low-carbon steel, but will afford an advantage in machining. Through his investigations, Mr. Abbott has discarded certain alloys and chosen 15 types of steels that the company will use in making its own forgings. Among the latter types are chrome-nickel, chrome-vanadium, nickel and the silicon steels.

A hardening compound is used for the carburization of metal parts, where only a hard surface is required, but the company will make the refining of both core and case, its principal specialty. The compound is a development of the secret process used by manufacturers of armor plate. An advantage claimed for the new compound is that it will infuse the carbon to greater depths in the steel and can be run as high as 150 furnace heats, whereas the ordinary mixture loses its strength much earlier.

The Plant

The works are housed in a rectangular building, 75 x 50 feet, construction having been started in May and operations begun about Sept. 1. The building is of steel construction, and is high enough to afford sufficient clearance for an electrically-operated Victor R. Browning crane, equipped with a 2-ton hoist and provided with four turntables. The crane will serve the furnaces and tanks and will also command all parts of the plant. The building is well lighted and at night 24 150-watt lights brilliantly illuminate every part of the plant.

The heat-treating equipment consists of two under-fired, checker-work, semi-muffled, double-opening gas furnaces of special design; one cyanide furnace; four lead furnaces; one lead-drawing furnace; one oil-drawing furnace; large oil, soda and water tanks; two small oil tanks and one small soda tank for quenching and cleansing. Space has been left for the installation of a third large heating furnace which will be oil-fired, and of a capacity to handle material up to 25-foot lengths.

Special Furnaces

All the furnaces were built from special designs prepared by the company's consulting engineer, with the exception of the oil-drawing furnace, which was installed by the Strong, Carlisle & Hammond Co., Cleveland. The tanks were installed by the H. E. Teachout Boiler Works, Cleveland. A Roots positive pressure blower, with a capacity of 3,000 cubic feet of free air per minute, driven by a 35-horsepower General Electric motor, also has been installed.

The question of proper heat-treating is, of course, intimately associated with that of knowing at all times the temperature under which the metal is being worked. For this purpose the company chose the new type of pyrometer recently developed by the Beighlee Electric Co., Cleveland, and which is shown in Fig. 5. The pyrometer is encased in brick, and rests on a concrete foundation, which extends 4 feet underground, effectually preventing any possibility of jarring

FIG. 4—STEEL PINIONS BEING TREATED IN THE LEAD-DRAWING FURNACE

the registering gage. This type of pyrometer will be described in detail in a subsequent article to be published in THE IRON TRADE REVIEW. Registering gages are located both in the plant and in the office, affording a double check on the work being done.

The large heating furnaces, shown in Fig. 3, have been installed near the center of the plant, and each has a capacity of 8 tons in 10 hours. The fuel used is natural gas. The chamber of one furnace is 10 x 3 feet x 17 inches, and that of the other, 10 x 3 x 2 feet. The chambers are lined with fire brick and have a wearing plate to protect the bottom of the furnace. Each furnace is of the semi-muffled type, the top being open and the material undergoing treatment is protected on the bottom and sides from the direct action of the flames. Openings were left for four pyrometer couples, the attachments being clearly shown in Fig. 2. The crane will be used for charging and discharging the furnaces.

The doors of the furnaces are balanced in all positions by a double quadrant and chain, compensating weights on the sides taking up the weight of the doors and rendering their opening and closing a simple operation.

These furnaces will be used for heat-treating large forgings and infusion work. The heat-treating process consists simply of applying the correct heat to bring out the latent properties of the steel.

Infusion Work

In infusion work, the small parts are packed in metal containers or boxes. These may be of either wrought or cast iron or steel, a good grade of white iron having been found to be most satisfactory for the work. Loose fitting covers are used and after packing, these are sealed with a mixture of sand and fire clay to afford protection from the direct action of the flames.

The parts to be treated are packed in the containers together with the compound, each part being surrounded by the compound to about three times the depth of case required. For example, to produce a penetration of ⅛ inch a layer of compound ⅜ inch thick, is used. The usual method is to place a ¾-inch layer of the compound in the bottom of the box and to lay the metal parts and compound alternately until the container is filled, when it is sealed and ready to be placed in the furnace.

The average depth of case now employed is about 1/32 inch. In the cyanide process, where a very thin film is required, the depth of case is 0.001 inch, while by other methods as high as 1/16 inch is sometimes employed. The Steel Improvement Co. claims for its compound that it can produce commercially a case up to 2½ inches.

Treating Large Forgings

In treating large forgings, they are placed in the large heating furnaces, which have a range of temperature from 1,500 to 1,900 degrees Fahr. The temperature is held at the required level during treatment, when the gas is turned off and the metal is allowed to cool in the furnace until below a red heat.

This treatment gives the metal a

FIG. 5—BEIGHLEE PYROMETER MOUNTED ON A CONCRETE FOUNDATION

soft core and case, with none of the coarse-grained and crystalline structure of the untreated metal. For complete treatment, the forging is given from one to three re-heats at temperatures ranging from 1,200 to 1,900 degrees Fahr., each re-heat being at a lower temperature than the one preceding in order not to affect the work just completed.

The smaller furnaces are used for re-heating small parts. The company has had considerable success with the lead type of heating furnace and eliminated the trouble usually experienced due to the lead adhering to the metal. The use of this type of furnace, with the metal part immersed in the lead, prevents exposure and scaling, while the resistance of the lead to sudden changes in temperature, insures a constant, uniform heat.

Three of the lead furnaces and the cyanide furnace have iron crucibles, 32 inches deep by 18 inches wide, while the fourth lead furnace has a crucible of equal depth, but 20 inches in diameter. These crucibles will hold 1,500 pounds of lead. The oil-drawing furnace has a crucible, 34 x 19 x 12 inches while the lead-drawing furnace, shown in Fig. 4, has a capacity of 10 tons in eight hours.

The cast iron water tank is located near the large heating furnaces, as shown in Fig. 2, and is served by the crane. It is equipped with the German method of coil circulation, which insures the constant agitation of the water. Under standard water pressure, the tank, which has a capacity of 2,500 gallons, can be emptied and filled in from four to five minutes.

The oil tank is 10 feet long, 5 feet wide and has a depth of 6½ feet, with a capacity of 2,500 gallons. Quenching in oil is used where toughness is required, while water quenching promotes hardness. The large soda tank, which is used for cleansing, is 10 feet long, 5 feet wide and 3¼ feet deep, with a capacity of 1,250 gallons. The small oil-quenching and soda tanks have a diameter of 33 inches and a depth of 45 inches.

Will Make Rolls

The company is equipped to manufacture its own forgings, but also treats those sent in for refining. With the expansion of its business, the company plans to manufacture rolls for all classes of rolling mills, and tests made by various rolling mill interests of the rolls, treated by the Steel Improvement process, have shown a satisfactory wearing surface. Another branch of manufacture which the company expects to enter later, is that of manufacturing dies for drop forging, cold pressing, etc.

The directors of the company are: W. B. Cleveland, George W. Hammond, W. H. Wherry, W. C. Whyte and R. R. Abbott.

Steel Works Magazines

The employes of the Illinois Steel Co., Chicago, have commenced the publication of two new magazines. One is issued at the South Works and is known as the *South Works Review*, and the other, issued at Joliet, is entitled *The Mixer*. Both are published monthly. The *South Works Review* is edited by J. H. Smith, C. H. Hall being associate editor.

Manufacturing Armor-Piercing Shells in Spain

Open-Hearth Steel is Used in Place of Crucible and Excellent Results Are Obtained — Heat-Treating and Subsequent Finishing Processes

The manufacture of ammunition for heavy ordnance is not often thought of by Americans in connection with the Spanish army or navy, but at Trubia, in Spain, the government has established a well-equipped arsenal for that purpose. There the work was inaugurated by Gen. Leandro Cubillo, a specialist in coast defense, in whose charge it remained for a number of years, and, in a paper read before the Iron and Steel Institute of Great Britain, he gives some valuable details of his experience.

In making heavy projectiles at Trubia, chrome and chrome-nickel steel are ordinarily used, analyses of three typical specimens showing the following elements:

	No. 1, per cent.	No. 2, per cent.	No. 3, per cent.
Carbon	0.848	0.818	0.485
Manganese	0.381	0.294	0.582
Chromium	2.311	2.371	0.749
Nickel	.....	.....	2.545
Silicon	0.163	0.220	0.400
Phosphorus	0.020	0.030	0.040

FIG. 1—SHELLS WHICH PIERCED CLEAN HOLES THROUGH ARMOR PLATE. THE CHROME-NICKEL STEEL PROJECTILE AT THE RIGHT WAS NOT DAMAGED

Open-Hearth Steel Used

The melting of the steel at Trubia is effected in open-hearth furnaces. Elsewhere on the Continent and in England, General Cubillo states, crucible steel is used for shells, with a view to obtaining material of the greatest possible purity. It has been demonstrated at Trubia, however, that steel can be produced in the open-hearth furnace low enough in phosphorus and sulphur to be entirely satisfactory for projectiles. In securing this result, the best raw materials obtainable such as Swedish iron and pudded blooms of Bilbao hematite iron, are employed. The ferro-manganese, ferro-chrome, nickel, and ferro-silicon used as additions are the purest obtainable of this class of metals. For the oxidation of the charge, Campanil ore is used, of the best quality to be found in the Bilbao district. The melting and refining processes are conducted with the greatest care, so as to avoid oxidation of the bath, and should it become oxidized, deoxidizers are added at the end of the heat. The ferro-chrome and nickel additions before charging are preheated in a special furnace alongside the melting furnace, to avoid cooling the bath. The charge is not completely decarburized, but is tapped when the calorimetric analyses at the end of the refining operations indicate that it has reached the requisite degree of carburization, taking into account, of course, the carbon in the ferro-chrome added to the bath.

The metal, when finished, is poured into molds of square section with rounded corners. They are lined at their upper ends with refractory material, intended to keep the metal fluid at the top as long as possible, in order to feed the shrinkage of the steel as it cools, thus tending to obviate piping. From the shape of the mold, Fig. 3, it will be noted, also, that there is no attempt at compression. It has been Gen. Cubillo's experience that provided the ingots are free from blow-holes and are poured in molds lined at the top, compression does not materially improve the physical and mechanical properties of the steel, the only substantial advantage being a saving of metal.

At Trubia, as in most plants engaged in the production of armor-piercing projectiles, forging forms a part of the process of manufacture. Early in the operations there the question arose: Is forging an absolute necessity, or, on the other hand, can the projectile be cast in its approximate final form, and require no further operation to finish it than the necessary heat treatment? Theoretically, it has been proved that a metal free from blow-holes derives all its physical and mechanical properties from its chemical composition and the subsequent heat-treatment. If, therefore, the steel founder can be relied upon to produce an absolutely sound metal, forging can be dispensed with, for the principal object of forging is not so much to give the pieces their final shape as for the purpose of transforming the crystalline structure, due to casting in metal molds, into the fine-grained and almost amorphous structure which a material with the necessary physical and chemical properties must possess.

Annealing Necessary

In any case, the annealing of the metal is indispensable after casting without forging, or after forging, if forging is practiced. If the metal has simply been cast, annealing has the effect of restoring the molecular equilibrium, which will have been destroyed by the unequal cooling of the steel in the metal mold, and the equilibrium imparted by annealing puts the piece into good condition to undergo the subsequent heat-treatment. As regards hardening and tempering, these are absolutely indispensable operations, but the final hardening of the point presents the principal difficulty in the manufacture of the projectile. At Trubia projectiles undergo two hardening processes—the first by quenching in oil, followed by tempering, and the second when the mechanical work upon the projectile is completely finished. This final hardening operation is the more important of the two, being that which gives to the point of the projectile that superior hardness which enables it to attack the hardened surface of the plate, and completely pierce it, whether striking it directly or at an oblique angle.

The forging of piercing projectiles

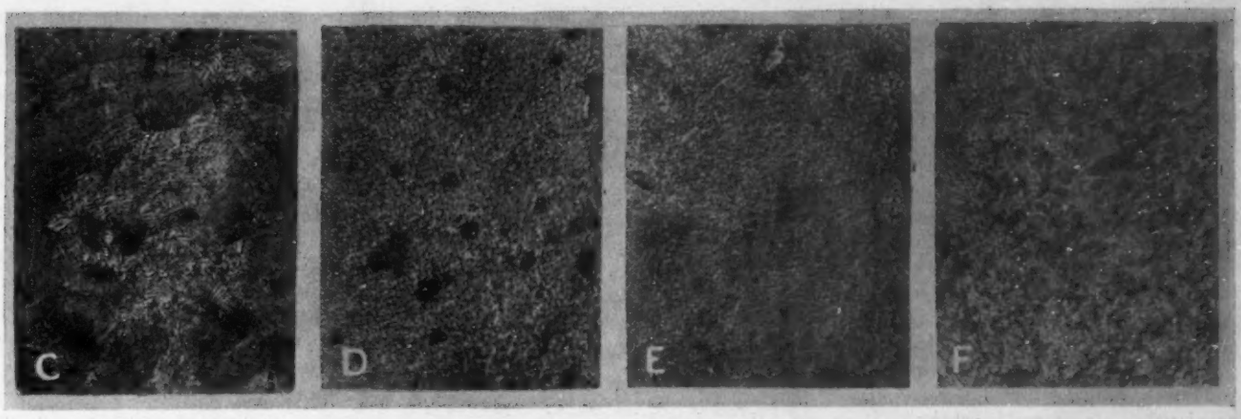


FIG. 2—MICROPHOTOGRAPHS, C, D, E AND F

Chromium-nickel steel projectile specimen, annealed after forging

Chromium-nickel steel projectile specimen, after hardening in oil and tempering

Chromium steel projectile specimen, annealed after forging

Chromium steel projectile specimen, after hardening in oil and tempering

is an operation requiring the greatest care. Taking account only of the carbon percentage the material may be classed as hard steel, and more completely so when it is a chrome steel. It is of great importance that the ingot should be preheated before introducing it into the reheating furnace, and even then it is desirable that the furnace should be at a sufficiently low temperature. Unless these precautions are carefully observed the ingot is likely to fracture transversely, as has more than once happened at Trubia. The reheating having been carefully performed in this manner, the ingot of 2½ tons is forged under the press until it is circular in section throughout its length, and of a diameter which exceeds that of the finished projectile by just so much as to allow the necessary machining. The greater part of the head is removed by cropping. The blank is then reheated and the point is forged. The annealing is performed at the temperature deduced from cooling curves, and the operation being complete, the blank is passed to the machine shops.

In the machine shop projectiles are first cut to length, and then bored out in order to form the cavity intended to receive the explosive charge. At the same time the cylindrical exterior and the point are turned in the lathe, and the projectile is then ready for hardening in oil.

Hardening and Tempering

Though it is not necessary that the whole projectile should receive the intensive thermal treatment which is required to give to the point the hardness necessary for piercing, it is considered, nevertheless, that the hardening of the entire projectile in oil is extremely beneficial. As the result of this operation, which must be followed by tempering, the material acquires an extremely fine grain, and excellent physical properties, as shown in the tests of the specimen shells given in the accompanying table.

For oil-hardening, a vertical furnace, heated by a gas-producer, is provided. The projectile is heated about 100 degrees above its critical point, the temperature being measured by a Le Chatelier pyrometer. The hardening is then performed in an oil bath of a capacity equal to ten times the weight of the projectile. The tempering is carried out at a temperature of 400 to 500 degrees Cent.

Having been oil-hardened and tempered, the final treatment is given to the point, and the projectile is finished.

After receiving the final heat-treatment, the projectiles remain for about

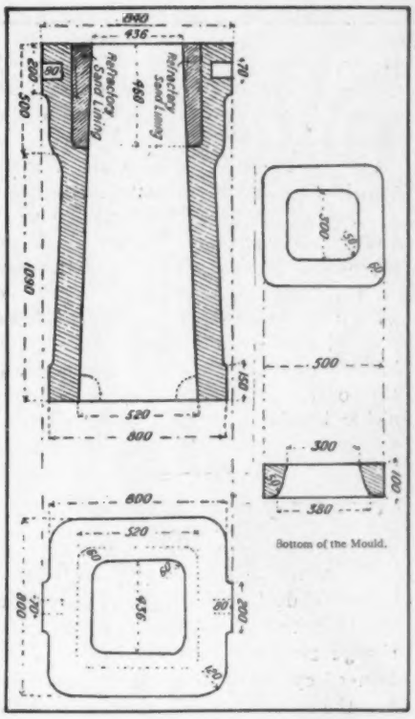


FIG. 3—MOLD FOR A 2½-TON INGOT. THE DIMENSIONS ARE IN CENTIMETERS

eight or ten days in the hardening department, at the end of which time, if they have not fractured, their capacity to resist sudden changes of temperature is tested. The object of this test is to ascertain whether a projectile can withstand, without breaking, a sudden change of temperature of about 60 to 70 degrees, which is a greater variation than is likely to occur in extreme climates. The test is performed by placing the projectile for a certain period in boiling water until it attains that temperature, and then plunging it suddenly in cold water.

Breakages

Though it very rarely happens that projectiles fracture on being hardened in oil, fracture may occur after the point has undergone the final heating operation. In view of the very drastic nature of this treatment of the metal, which, if it contained the simple equivalent of carbon, would be classed as very hard, and considering also the thickness of the point where it joins the cylindrical portion, it is difficult to carry out the hardening operation in such a way as not to produce internal stresses. Special precautions are necessary, on account of the fact that the operation introduces a state of unstable equilibrium in the material and is not followed by a tempering process, which would relieve these abnormal stresses. The effect of this rapid quenching of the surface, though somewhat relieved by the heat yielded up by the internal layers, cannot fail to create considerable tensile and compressive stresses, sometimes of a magnitude sufficient to overcome the cohesion of the molecules and produce fracture. When this delicate hardening operation was first practiced, it was a frequent occurrence for the projectile to crack, but that rarely happens now, and when it does, the cracks only become visible after several days. Sudden changes of atmospheric tem-

perature must be avoided, the slight stresses due to such changes, when added to those caused by hardening, being sometimes sufficient to produce fracture. The cracks occur in the point at a greater or less distance from the extremity, and in a plane normal to the axis. Some idea may, therefore, be formed of the enormous stresses in the metal produced by hardening. It is within the recollection of General Cubillo that on a winter morning, when the temperature suddenly rose several degrees, the points of six or eight projectiles which had been hardened about eight days previously developed cracks. Such cracks seldom occur in the plane of the diameter, but almost always vertically through the point. Fracture is not always due to physical causes only, as it has been proved that by diminishing the percentage of manganese, the number of breakages is also diminished.

In the accompanying reproductions of micro-photographs, Fig. 2, are shown single and double alloy steels in different states, namely, annealed after forging and quenched and tempered in oil before undergoing the final treatment. The steel annealed after forging is marked *C* and *E*, the chromium is denoted by *C*, and, as the carbon percentage would lead one to expect, the microstructure contains pearlite and free ferrite; *E* is a chrome steel with a carbon percentage, which approximates that of the eutectic, and its structure is almost entirely pearlitic. Micrograph, *D*, shows the chrome-nickel steel, and micrograph, *F*, the chrome steel after quenching and tempering in oil preparatory to the final treatment. The micrographic constituents are those which are characteristic of this class of carbon steels, which have undergone the heat treatment alluded to.

Hard Alloy Steel for Caps

Since the introduction of cap projectiles it has been considered good practice to make the cap of a softer material than the projectile, using an extra mild steel. At Trubia, however, a double alloy steel is used, although with a lower percentage of chrome and nickel than that contained in the projectile steel. The following is the composition of a steel for caps, which has given excellent results:

	Per cent.
Carbon	0.40 to 0.45
Silicon	0.10 to 0.15
Manganese	0.50 to 0.60
Phosphorus	0.3
Sulphur	0.3
Chromium	0.30 to 0.35
Nickel	1.30 to 1.50

The tensile properties are given in the following table:

	Elastic limit, lbs. per sq in.	Tensile strength, lbs. per sq. in.	Elongation in 2.4 in. per cent.
Annealed after forging	48,820	94,160	10
Hardened in oil and tempered	81,260	107,060	12

The steel for the caps is melted in an open-hearth furnace, and is composed of the best materials, the operations of melting, refining and tapping being performed with the same degree of care as is bestowed on the material of the projectiles. The steel is forged in round bars after removal of all surface cracks from the ingot, and is then annealed and cut into short lengths, convenient for stamping. After stamping, the caps are oil-hardened and tempered in the same manner as the projectile, and then undergo the final thermal treatment.

In conclusion, General Cubillo gave the details of various tests carried out at Trubia with shells manufactured under this process. Three of these, corresponding to the projectiles covered by the accompanying table, are shown in Fig. 1. All of the shells pierced a clean hole through the plate, but the chrome-nickel projectile was the only one which did so without either breaking or undergoing deformation.

PHYSICAL TESTS OF SPECIMEN SHELLS.

Nature of test.	Elastic limit, lbs. per sq in.	Tensile strength, lbs. per sq. in.	Elongation, in 2.4 in. per cent.	Material.
Along the grain	42,560	91,060	20.5	Chrome steel for a 6-inch projectile, annealed.
Across the grain	38,700	76,740	21.0	
Along the grain	70,940	102,220	18.5	Chrome steel for a 6-inch projectile quenched in oil and tempered.
Across the grain	67,080	87,060	13.0	
Along the grain	115,520	134,160	19.0	Chrome nickel steel for a 6-inch projectile, quenched in oil and tempered.
Across the grain	112,020	131,580	11.5	

Frequency of an Electric Power Circuit

Managers and superintendents who have to deal with electric power in the operation of the plants under their charge are often puzzled by the question of cycles or frequency. Engineers or the salesmen of electrical companies make certain recommendations on the subject, which are usually followed, but in many cases without any clear comprehension of what these terms mean. They are, however, easily explained; and both relate wholly to alternating current machinery.

In a synchronous generator, which is the almost universal type, the current has one-half of a wave or an alternation for each pole passed by a given armature conductor. A cycle is two alternations, forming the complete wave. Frequency is the number of cycles per second. As there is one cycle for each pair of poles passed, the frequency is, therefore, equal to half the number of poles in the generator multiplied by the revolutions made by the armature in each second.

Thus, to deliver current with the common frequency of 60 cycles per second, equivalent to 7,200 alternations per minute, a 2-pole alternator would have to be driven at 60 revolutions per second, or 3,600 revolutions per minute, a 4-pole machine at 1,800 revolutions per minute, etc., which is actually the case with the high speeds made possible in the design of generators direct-connected to steam turbines.

Engine or waterwheel-driven generators are made multipolar, and usually with many poles, to avoid speeds which for such units would transcend the limits of safety.

The transformer, by means of which alternating current transmitted at high voltage can be stepped down to any operating potential desired, has been one of the principal factors in bringing about the general use of that system; and the higher frequency—other things being equal—the greater is the efficiency of a transformer. Hence, when alternating current was used mainly for lighting circuits, frequencies as high as 140 cycles per second were not uncommon. Motors, however, have been found to operate to the best advantage at frequencies as low as 25 cycles; but, with a lighting circuit added, up to 50 or 60 cycles is desirable. Accordingly, those three frequencies, with others intermediate occasionally used, have come to be accepted as standard. For circuits taking their power from steam turbine units, 25 cycles is practically the minimum, owing to the high speeds of turbo-generators; and this may also be regarded as the lowest limit for a load consisting wholly or partially of lights, as below that frequency incandescent lamps will flicker. On the power side the series alternating current motor, whose economy rises as the frequency decreases, is the only apparatus for which less than 25 cycles would be required.

The Use of Electric Power in Mining Operations

How Central Power Stations in the Coal and Coke Districts of Pennsylvania Effect Operating Economies, With Details of the Ebensburg Coal Co.'s Plant

By S Rice

After many years of comparative indifference on the part of operators, recognition is at length being given to the fact that the costs of coke making, of ore smelting, and of the manufacture of iron, steel and their products are largely influenced by the expense of mining coal; furthermore, that in coal production, the generation and distribution of power plays an important part.

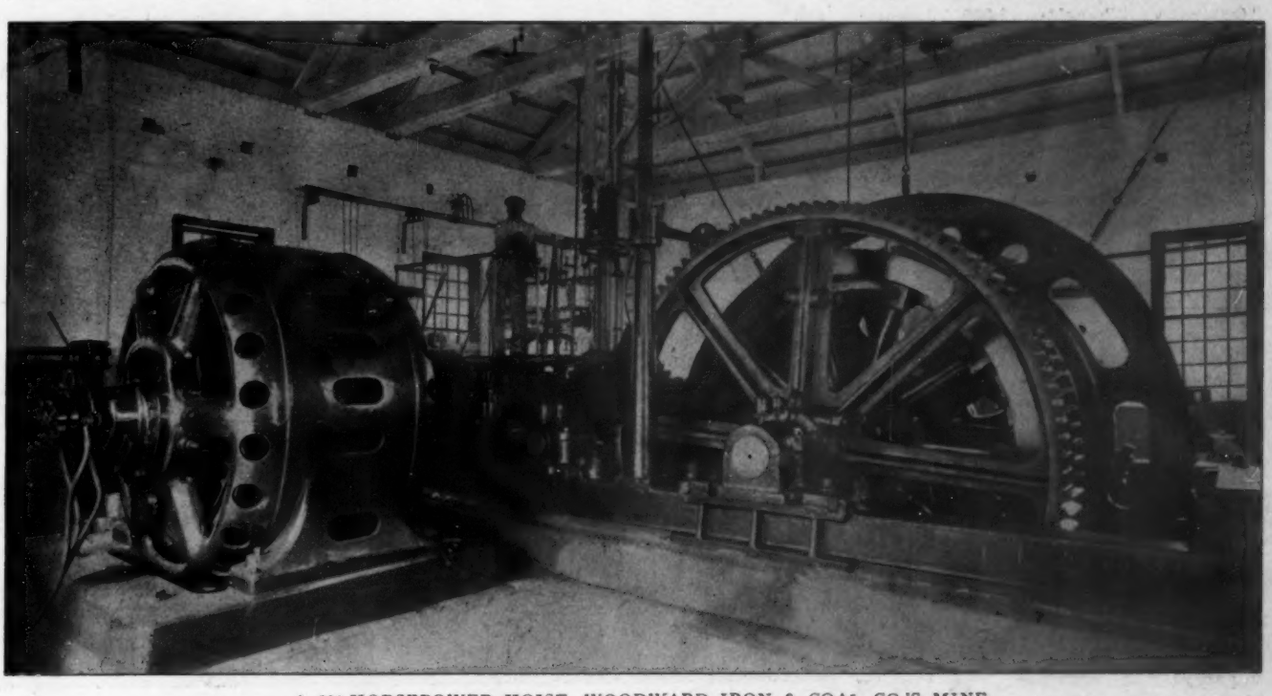
It has been conclusively demonstrated that for a system of any extent the transmission of power can be effected in the form of electricity over a wire with far less loss than through a steam pipe, by compressed air or in any mechanical form. European countries have, until very recently, been considerably in advance of the United States in reducing the cost of generating and transmitting power. This is largely attributable to the higher price and greater scarcity of fuel abroad. Here coal operators generally gave far less attention to the cost of their power. Where single mines were operated by individual companies this element of operating expense, on account of being relatively small, was almost lost sight of; but where a number of mines have been grouped under a single management, the economical generation of power is now being given more careful consideration and the same principles have lately been applied that are used by large consumers of power for purposes other than the mining of coal.

Individual Power Plants

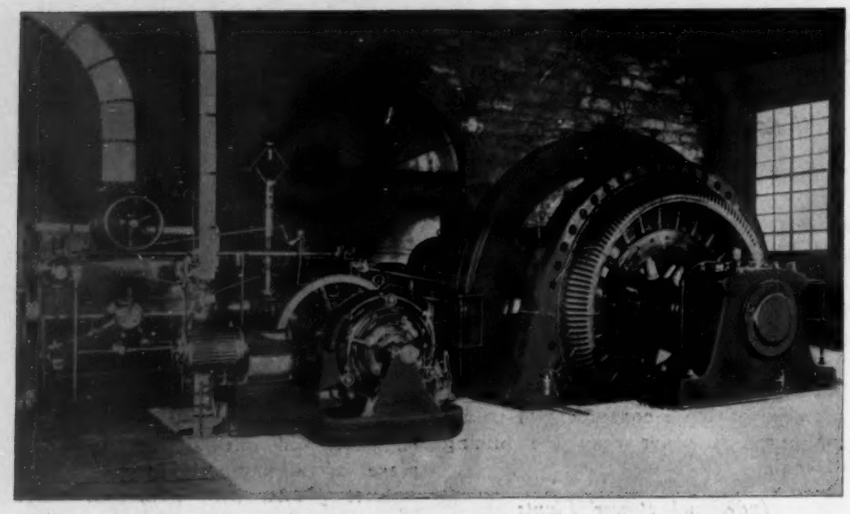
In the principal coal mining districts of the country, arrangements have been made, in a number of instances, for generating all or nearly all the power used on the property in a single power plant and distributing it among the separate workings. In Pennsylvania there are, for example, the Rochester & Pittsburgh Coal & Iron Co., at Punxsutawney; the Berwind White Coal Mining Co., at Windber; the H. C. Frick Coke Co., near Connellsville; the Pennsylvania Beech Creek and Eastern Coal Co., at Cresson, and the Somerset Coal Co. at Jenner; in West Virginia, the U. S. Coal & Coke Co., at Gary; the McKell Coal & Coke Co., at Kilsyth; the Elkins Coal & Coke Co., at Bretz; the Low Moor Iron Co., at Kaymoor, and the Pocahontas Consolidated Coal Co.; in Alabama, the Tennessee Coal, Iron & Railroad Co. and the Woodward Iron Co., near Birmingham, and others of equal importance.

Too much emphasis cannot be given to the fact that, where all power is generated in one power plant, one engineer and one fireman take the place of a number in the various smaller plants, with numerous other elements of expense in proportion. The coal and ashes can be handled more economically. Steam engines or turbines can usually be run condensing, and repairs and maintenance are required only for a few large power units rather than for many small units. It is obvious that a material saving can be effected and it can be shown that this saving is greatly in excess of the interest charges on the additional investment required.

In the use of electricity for the transmission of energy for power and lighting purposes, there is the choice of either direct current or alternating current. Direct current cannot be used in excess of certain distance. Beyond that the cost of copper wire becomes prohibitive. Electric energy, being measured in watts, is the product of the volts by the amperes. The heating effect of the



A 500-HORSEPOWER HOIST, WOODWARD IRON & COAL CO.'S MINE



THE McKELL COAL & COKE CO.'S PLANT AT KILSYTH, W. VA.

current on the wire and the consequent loss of energy in transmission is determined by the amperes which are carried. This loss is measured by a drop in voltage or pressure and is comparable to the drop in pressure of air where power is transmitted by compressed air.

If current is generated at 250 volts, and a load of 1,000 amperes is transmitted over a given line, the total energy will be expressed as 250 kilowatts. If the same current, namely, 1,000 amperes, is generated at 500 volts, the energy would be 500 kilowatts. Transmission wire for carrying 250 kilowatts at 250 volts could be used equally well for transmitting 500 kilowatts at 500 volts. The same would be true if the voltage were raised to eight times the amount, or 2,000 volts. Therefore, 2,000 kilowatts can be transmitted over the same wire, as the amperes are the same.

Let us assume that this line is of such length that when transmitting a current of 1,000 amperes the total drop will be 25 volts. Twenty-five volts is a measure of the loss of the line. In the first instance, with 250 volts on the line, this represents a loss of 10 per cent. With 500 volts 25 volts represent a loss of 5 per cent, and with 2,000 volts the loss is 1¼ per cent. Thus it is plain that a given wire which transmits 250 kilowatts at 250 volts with a 10-per cent drop, by raising the volts to 2,000, will transmit eight times the amount of energy, and this at only 1¼ per cent loss.

Cost of Copper Wire

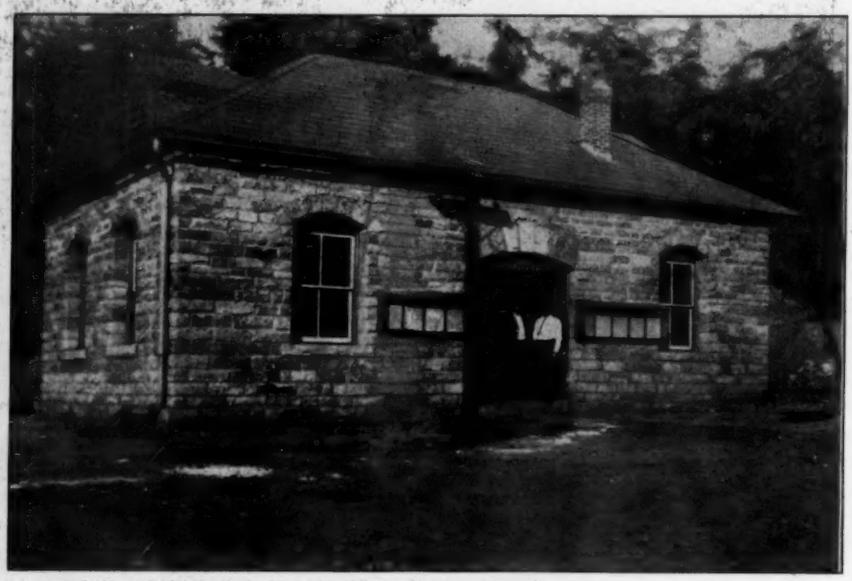
The cost of copper for transmitting electric current depends upon the amperes to be carried. From this is apparent the desirability of keeping the current small, but in order to transmit sufficient power at the lower amperes it usually becomes necessary to raise the voltage.

Direct current generators and motors are preferably not built to operate at higher than 600 volts on account of sparking at the commutator. Furthermore, the exposed parts of the commutator with its brushes become a menace to the life of the attendant when the voltage exceeds 600. Therefore, if higher than 600 volts is desired, alternating current offers the best medium for transmitting power. Direct current generators for railway service are in some cases operated at 1,200 volts, where the power house can be placed in the center of a short interurban line; but the car motors are 550-600 volt machines operated in series, and this practice is not typical.

Mining locomotives, chain machines, coke oven larries, coke drawing machines and pushers are ordinarily built only with motors for direct current. With alternating current delivered at the mine, it therefore becomes necessary to change a part at least to direct current, and the apparatus which accomplishes this may be either a motor-generator set or a rotary converter. For other work, such as driving fans, pumps, crushers, and for rope haulage, alternating current motors can be used to even greater advantage than direct current motors. In mining operations where it is desirable to use compressed air punchers in place of mining machines, and where the mine is located some distance from the power plant, electricity is still applicable. In such cases the plan is to place the compressor at the pit mouth or in the mine, and for operating it use a large alternating current motor, preferably synchronous on account of its service in building up the power factor, thus making the compressor motor-driven instead of steam-driven. Up to the present time there have been some mining operations where compressed air was transmitted several miles, but most of these are now being changed, resulting in the abandoning of the long, wasteful pipe lines, and moving the compressor to the mine.

Frick Co.'s Central Station

The H. C. Frick Coke Co. at Connellsville, Pa., has a central power plant having large capacity. Power transmission lines radiate from this station, supplying current to a dozen or more different shafts, each equipped with a rotary converter for furnishing such direct current as is required. This plant is of special interest on account of the fact that coal is seldom used directly for developing this



SUB-STATION AT MASONTOWN, W. VA., OF THE ELKINS COAL & COKE CO.

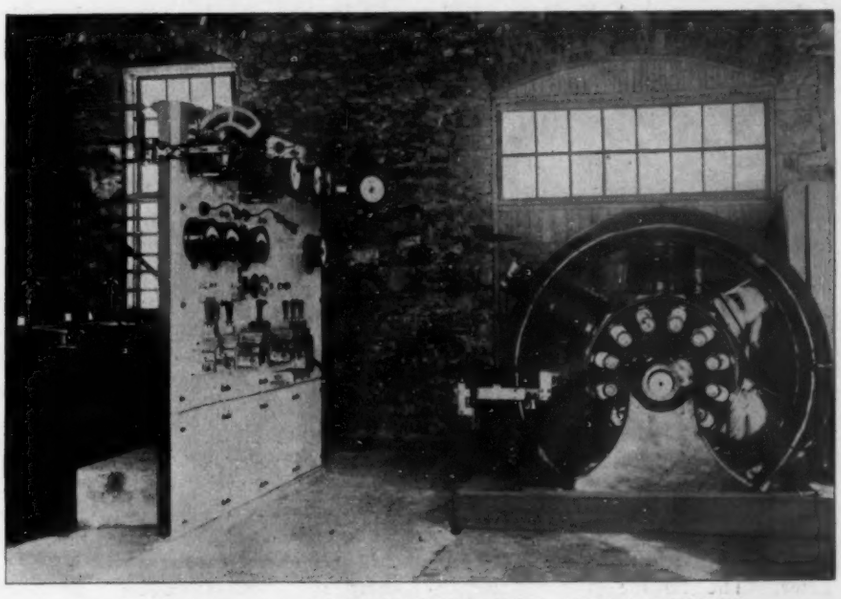
power. The heat for the boilers is obtained from a number of coke ovens, which are connected with flues so that the waste heat from the oven is utilized.

The power system of the Elkins Coal & Coke Co. also is a notable example of the introduction of high voltage methods of generation and distribution. A station located at Bretz, W. Va., the site of one of the older mines, was originally provided with two moderate-size direct current generators, these being used to supply direct current which can be economically utilized in the immediate vicinity. Later it was desirable, among other extensions, to open a mine at Masontown, a point about a mile and a half distant. In the immediate vicinity of the new mine were to be located coke ovens, together with conveyors, crushers and other attendant apparatus. A 2,200-volt alternating current generating plant was installed in the old power house at Bretz and the capacity of the boiler house was increased. High voltage current was then transmitted to Masontown, where it was received at a small rotary converter sub-station. The rotary converter located here supplies direct current for locomotives, larries and coke drawers. Current is provided at Masontown, either direct or alternating, for driving fans. For the coke ovens nearby the high voltage alternating current is used in a 300-horsepower motor for driving a crusher. Alternating current motors are used also for driving conveyor belts. When other mines are to be opened in the vicinity it only becomes necessary to extend the high voltage transmission line, with the possible addition of greater generator capacity at the power house. Had the plan outlined here not been carried out, it would have been necessary to build a new power house at Masontown with a complete equipment of boilers, engines and generators. Without going into figures, it is obvious that even the first cost of one sub-station now operating is much less than if a complete new power plant had been installed at Masontown, while maintenance and depreciation are but a fraction.

THE EBENSBURG COAL CO.'S POWER PLANT AND TIPPLE AT COLVER, PA.

Fuel to Be Used

Assuming that the central station idea in the generation of power has been decided on, an operator is confronted with the further problems involving the choice of fuel and prime movers. With reference to fuel, the coal and coke operator frequently has the choice of using either coal or coke oven gases for generating steam in his boiler. There are now many operations where the waste gases from coke ovens are utilized for generating steam. This is commonly obtained from the ordinary bee-hive oven by constructing a large flue parallel to the row of ovens and providing each oven with an outlet into this flue. Dampers are installed to control the connection of each oven with the main flue. The hot gases are conducted by the main flue directly to the boiler house. It is commonly assumed, in estimating the power required for such a plant, to rate each oven at 15 to 20 horsepower, depending upon the daily coking capacity. With such an arrangement, no coal is required for generating power for the mine and coking operations. The only charge for fuel would be represented by the interest on the investment in the flues. Experience has shown that this arrangement accomplishes a great saving and satisfactory results have been obtained. Some difficulty has arisen in connection with flue construction, usually on account of the great heat which it transmits. Troubles have also arisen in connection with warping and melting of the small dampers at the mouths of the individual ovens as well as the large dampers required at the flue terminals in the boiler house. All of these troubles, however, can be successfully overcome by the proper choice and use of material. Lined wrought iron is among the best where by-product ovens are used, the gas delivered from these ovens can be utilized directly in gas engines: in fact, there are quite a number of installations in Europe where this practice is carried out. By conduct-



SUB-STATION AT SYDNEY OF THE McKELL COAL & COKE CO.

ing this gas into gas engines instead of burning it under boilers, it is possible to secure between two and three times as much power; that is, the thermal efficiency of the gas engine is very high.

Type of Prime Movers

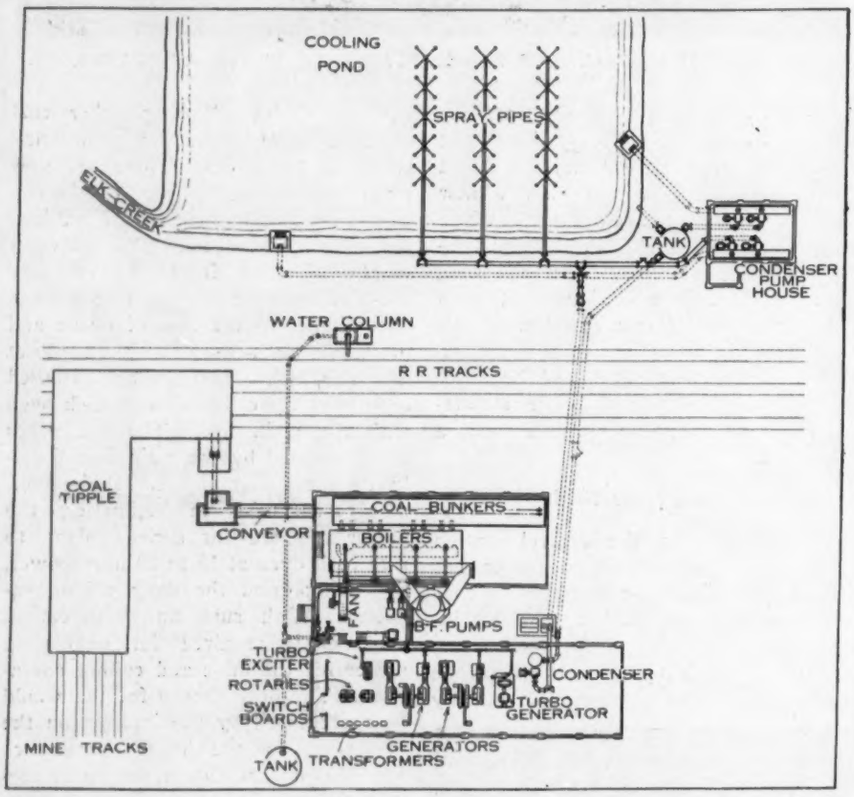
As stated above, having decided on the central station, the next problems which confront us are fuel and type of prime movers. Under fuel only the hot gases from beehive ovens and the richer gases from the retort type of oven have thus far been considered, with gas engines for generating power. The other two prime movers in this field are the steam engine and steam turbine. In order to secure a maximum economy where it is necessary to use steam engines, it is well to centralize the power, thus making the individual units large. The Corliss, or four-valve type of engine, will secure the best steam economy, and naturally the conditions will be greatly improved if the engines are made compound and operated condensing.

First Cost of Installation

Operators not infrequently attach too great importance to first cost without realizing that, by spending more money and securing highly economical engines, their yearly earnings will be increased on account of having more coal to sell. Even where waste gases are used under the boilers, the capacity necessary, as well as the wear and tear on the boilers, is greatly reduced by the use of steam engines which are economical in their use of steam.

Recently steam turbines have become prominent as prime movers in coal operations. There are already a great many such plants in which turbines are being successfully operated, and to obtain the best results they should be run condensing. In addition to being highly economical in steam consumption, they have the merit of combining large power capacity in small bulk; thus the cost of the power house building itself can be reduced to a minimum. The cost of foundations is also almost a negligible quantity as compared with that required for heavy engines. Steam turbines have passed the experimental stage, and are now universally used wherever electric power is required.

One of the variable applications of steam turbines is presented when they are used in connection with non-condensing engines. With this arrangement they are known as low or mixed pressure turbines and receive the exhaust steam from existing engines. The turbine is then run between atmospheric pressure and a vacuum of say 28 inches. To illustrate the conditions more thoroughly, let us suppose that we have a plant consisting of several steam engine units aggregating 1,000 kilowatts running non-condensing with a pressure at the throttle of say 150 pounds. It is possible by supplying a low pressure steam turbine and condenser to secure an additional 700 to 1,000 kilowatts of energy from the exhaust steam from the engines, frequently doubling the capacity of the plant without adding any additional boiler capacity or requiring any additional fuel.



GENERAL PLAN OF THE POWER HOUSE, TIPPLE AND COOLING POND OF THE EBENSBURG COAL CO.'S PLANT AT COLVER, PA.

Ebensburg Coal Co.'s Plant

An excellent example of a turbine plant and electric power system is one which has just been completed for the Ebensburg Coal Co., of Colver, Pa., under the supervision of Frank C. Roberts & Co., Philadelphia. Here electricity is used as the means for transmitting power for all the operations incident to mining, from the time the coal is taken from the vein until it is delivered to the railroad cars. The main power house is located along the main railroad siding, about 1,800 feet from the portal of the mine tunnel. Electric current is generated at 2,400 volts, three-phase, 60 cycles, and will be delivered at this voltage to various sub-stations to be constructed as the development of the mine proceeds. At present only one of these sub-stations has been erected; it is located about one mile from the power house.

The steam plant consists of four 370-horsepower boilers, equipped with automatic underfeed stokers, which have proven very successful in permitting the use of cleanings, bone coal and such other refuse as is not generally salable.

The coal shipped from the mine passes over picking tables, thus enabling a uniform quality to be marketed. The refuse coal is discharged directly from the tipple to a crusher and is thence carried by a conveyor to an overhead bunker in the boiler house. From this bunker the coal passes by gravity through spouts to the automatic stokers. Small cars under the boilers receive the ashes and carry them to a refuse dump, some distance from the power house.

Electric Generating Equipment

The electric generating equipment consists of two 400-kilowatt generators, each direct-connected to a cross-compound Corliss engine. Each of these machines is provided with its

own exciter, which is driven by belt from the main shaft.

In addition there is also installed a mixed pressure turbine direct-connected to a 750-kilowatt generator, designed to operate with low pressure exhaust steam from the reciprocating engines mentioned, a condenser being installed in the engine room adjacent to the turbine. The steam mains are so arranged, however, as to permit of the operation of turbines under high pressure steam when so desired. In connection with the latter there has been installed a non-condensing steam turbine, direct-connected to an exciter of sufficient capacity for the entire generating plant, including a liberal allowance for future additions.

In the power house two rotary converters, of 200 kilowatts capacity each, furnish direct current at 275 volts for operating the tipple, which is located within 100 feet of the plant, and also for supplying current to the haulage locomotive trolley system extending from the tipple to the far end of the mine workings. Oil transformers for stepping-down the alternating current to the rotary converters are installed near the switchboard in the car house. The latter also contains the boiler feed pumps, forced draft fan and other auxiliary machinery. A water column is provided nearby for supplying water to the steam locomotives. A cooling pond, equipped with spray nozzles, is located about 200 feet from the power house and supplies water for condensing purposes. Four centrifugal pumps are provided at the pond for circulating the water used by the condensers. The tipple, including the car haulage system at end of yard tracks, is operated throughout by electric motors.

The Sub-Station

The sub-station thus far constructed contains two rotary converters of 200 kilowatts capacity each and one rotary converter of 500 kilowatts capacity, which operate in parallel and deliver direct current at 275 volts. Alternating current at 2,300 volts is received at the switchboard in this sub-station and is stepped-down by oil transformers to the proper voltage for delivery to the rotary converters. Direct current feeders are carried from the sub-station down the vertical air shaft and supply current for the mining operations proper and for the electric locomotive system.

At one end of this sub-station is located the mine ventilating fan, which is enclosed in brick walls and is provided with the necessary air passages, dampers, etc., so as to allow the fan to be used either as a blower or as an exhauster. The driving shaft of the fan extends into the end of the sub-station where suitable clutches, motors and double chain drives are provided so that the fan can be operated by either or both of the motors. The latter are 2,300 volts, three-phase, 60-cycle, variable speed motors of 100 horsepower each.

Electric Current for City Lighting

From the main switchboard in this sub-station current is also delivered to the town of Colver for illuminating and various power purposes. The lighting system consists of alternating current arc lamps for the streets and incandescent lamps in the buildings. Power is also furnished from the sub-station to a water supply pump, located three and one half miles distant, equipped with a 50-horsepower, 2,200-volt, three-phase, 60-cycle induction motor.

The total connected load now supplied by the entire power equipment consists of about 200-horsepower motors in the tipple, 1,000-horsepower of cutters, punching machines, pumps, hoists, etc., in the mine, one 13-ton locomotive, five 10-ton locomotives and three 4½-ton locomotives, in addition to the fan motors, condenser pumps, motor generator set, water supply pump and lighting system referred to.

IMPORTANT SUBJECTS

To Be Discussed at Meeting of Institute of Mining Engineers.

The October meeting of the American Institute of Mining Engineers, which is to be under the auspices of the iron and steel committee, will be held on Oct. 16 and 17, in the United Engineering Societies building, New York City.

Invitations have been sent out to the members of the following societies, through the respective secretaries, to attend this meeting and the dinner, which will be given on the evening of Oct. 17: American Society for Testing Materials, American Iron and Steel Institute, American Society of Mechanical Engineers, American Society of Civil Engineers, American Institute of Electrical Engineers, American Foundrymen's Association.

Members of these societies have also been invited to contribute to the discussion of the various papers to be presented at the meeting, a revised list of which appears below. Many individuals of national and international prominence have also been invited to contribute discussions to these papers, and the response to these invitations has been extremely encouraging.

Most of the papers have already been printed in the monthly Bulletins of the Institute, and it is expected that the others will be printed in advance of the meeting.

There is every indication of a large attendance at this meeting. The provisional program follows:

First Session, Oct. 16, 10 a. m.

W. A. Forbes. Blast Furnace Gas Cleaning.
W. H. Blauvelt, The Slagging Producer.
Prof. F. Peter (Leoben, Austria), The Generation of Steam by Waste Heat from Furnaces.
G. C. Stone. The Generation of Steam by Waste Heat From Regenerative Furnaces.
W. R. Shimer, Over-Oxidation of Steel.

Second Session, Oct. 16, 2 p. m.

H. F. Miller Jr., New Design of Regenerators for Open Hearth Furnaces.
Dr. Richard K. Meade, The Use of Powdered Coal as Fuel.
H. R. Barnhurst, The Use of Powdered Coal as Fuel for Metallurgical Furnaces.
W. S. Quigley, The Use of Powdered Coal as Fuel.
E. Stuetz, The Scoria Process for the Manufacture of Fine-Ore Briquettes.
Felix A. Vogel, Briquetting.
Felix A. Vogel, Use and Advantages of Briquettes in Blast Furnace Practice.
R. H. Lee, The Use of Nodulized Ore in the Blast Furnace.

Third Session, Oct. 17, 10 a. m.

H. M. Howe, Discussion of the Existing Data as to the Position of Ae_3.
H. M. Howe and A. G. Levy, Determination of the Position of Ae_3 in Carbon-Iron Alloys.
H. M. Howe, Ae_1, the Equilibrium Temperature for A_1 in Carbon Steel.
G. K. Burgess, J. J. Crowe, and H. S. Rawdon, Thermal and Microscopical Examination of Prof. Howe's Standard Commercial Steels.
H. M. Howe, The Divorcing of the Eutectoid in Meteorites.

Fourth Session, Oct. 17, 2 p. m.

R. R. Abbott, The Influence of Various Elements on the Absorption of Carbon by Steel.
J. V. Emmons, Some Phases of the Practical Treatment of Tool Steel.
W. E. Ruder, Grain Growth in Silicon Steel.
J. H. Hall, Shock Tests of Cast Steel.
G. H. Clevenger and B. Ray, The Influence of Copper Upon the Physical Properties of Steel.
J. H. Hall, The Life of Crucible Steel Furnaces.

Armor Plate Bids Rejected

Washington, Sept. 23.—Failing to receive figures showing the cost of production of heavy armor plate and other data from the Bethlehem Steel Co., the Carnegie Steel Co. and the Midvale Steel Co., Secretary of the Navy Daniels has finally rejected the recent bids of these companies for armor for battleship No. 39. The bids were identical and because of this the secretary has asked for facts showing the cost price, etc. Secretary Daniels said he does not propose to readvertise for new bids. The law grants him authority to invite new offers by mail and it is thought he will seek bids from foreign countries. It was recently stated by Secretary Daniels, however, that foreign makers would not submit any better figures for heavy armor than domestic makers because of a "world-wide understanding" among the manufacturers.

ESTABLISH NEW ZONE

Rate Reduction by Pennsylvania Enlarges Beaver Ore District.

Final establishment of the "new Beaver ore rate district," including Aliquippa and Midland, Pa., and Steubenville and Mingo Junction, O., resulted from the action of the Pennsylvania railroad in putting into effect a 70-cent rate on ore from lake ports. Permission to establish this rate was granted, Sept. 20, by the Interstate Commerce Commission, which had ruled previously that the Pennsylvania road could not reduce the rate to the old Wheeling district without also reducing its rate on ore to Pittsburgh.

The Wheeling & Lake Erie railroad established a rate of 70 cents to Steubenville and Mingo Junction on Sept. 15, the New York Central Lines having previously established the same rate to Aliquippa, Pa., where are located works of the Jones & Laughlin Steel Co.

The effect of this is to create a new Beaver district with a rate of 70 cents for direct iron ore from Cleveland, Ashtabula and Erie over the Pennsylvania and from Cleveland, Huron and Lorain over the Wheeling & Lake Erie. Previously, Midland, Pa., located between Aliquippa and Steubenville, had a rate of 78 cents and is served by the Pennsylvania railroad alone. At Midland are located furnaces and works of the Pittsburgh Crucible Steel Co.

Wheeling, Bellaire and Martins Ferry, O., are left out of the former alliance with Steubenville, the same rate formerly applying to both works.

Will Light New Stack This Week

The Canadian Furnace Co., Ltd., is planning to light its new blast furnace plant at Port Colborne, Ont., at 12 o'clock, noon, on Sept. 27. Invitations have been issued by the company to a number of distinguished iron and steel men and their wives to attend the lighting. A special train on the Grand Trunk railroad will leave Terrace station, Buffalo, for Port Colborne, Saturday morning, at 10 o'clock. Lunch will be served on the steamer Mojeska, leaving the furnace dock at 12:15 for Thorold, giving the party opportunity to view the Welland canal district to the point where the new canal will be constructed to Lake Ontario.

Thomas Wesley Jenks, of Avalon, Pa., for the last 10 years connected with the Carnegie Steel Co., died Sept. 22, aged 67 years. He was born in England, where his family had been identified with the steel manufacturing industry, and came to this country in his youth. He was connected with the Burden Iron Co., Troy, N. Y., and later took charge of the rolling mill of the A. & P. Roberts Co., at Philadelphia.

MALLEABLE HIGHER

In the Pittsburgh District—Fair Inquiry Pending.

Pittsburgh, Sept. 24. (By wire.)—Sales of malleable iron the last few days have brought out rather sharp advances in prices. One of the heavy consumers has closed for a round tonnage of standard malleable at a price equivalent to $14.50, valley, and many consider the market strong at that figure. Another malleable consumer has asked bids on a large tonnage for shipment through next year.

The Standard Sanitary Mfg. Co. probably will close this week for at least 2,000 tons of No. 2 foundry for fourth quarter shipment for its New Brighton and Allegheny shops, and 500 tons of No. 3 for the Allegheny plant. An inquiry is out for 1,000 tons of gray forge and another inquiry calls for 500 tons of foundry for shipment over the remainder of the year. The Allegheny Steel Co. is expected to close shortly for 3,000 tons of basic.

OCTOBER COKE

Being Negotiated and Some Transactions Booked.

Pittsburgh, Sept. 24. (By wire.)—Several negotiations for October blast furnace fuel have been opened and a number of consumers already have covered next month's needs. One eastern interest has bought part of its October requirements at $2.50, ovens. The New Jersey Zinc Co. has closed for 5,000 tons of October coke, but the price is not known. The leading shippers of strictly standard coke are refusing to shade $2.50, although it is known that offers of $2.25 and slightly less are being made. The market is expected to offer interesting developments before the end of the week.

Hearings Will Resume

New York, Sept. 24. (By wire.)—Hearings in the Steel Corporation dissolution suit will resume Oct. 1. The first witness will be an ore expert from the Superior district.

QUALITY TEST

Will Probably Prevent Extensive Imports of Billets, Says Mr. Samuel.

"Conditions with the iron and steel makers of England are reactionary at the present time after two or three years of exceptional activity," said Frank Samuel, the Philadelphia iron and steel merchant, discussing with a representative of THE IRON TRADE REVIEW his observations of the business situation abroad gained during an extensive tour of the British Isles, from which he has just returned. "Prices for iron and steel products are lower and the mills are not so well engaged. Labor conditions in England are very bad and they are affecting the business situation materially. Strikes in all trades and for all manner of demands, are numerous and there is general unrest among the employed class.

"One favorable factor at this time is the adjournment of parliament after a continuous session of two years. This will stop a certain amount of agitation on pending legislative measures which has been very detrimental to business."

Mr. Samuel is inclined to take a very conservative view of the possible effects of the new tariff upon American iron and steel makers. "I do not believe from my own experience and what I have observed abroad that the reduced duties on steel products will have a materially adverse effect upon the steel industry of this country. In the case of billets, the product of foreign mills is largely in the line of specialties. In other words, there is an important difference in sizes, quality and physical condition between American and foreign billets that is all in favor of the former. It has been my experience as an importer in the past that a great deal of trouble over the quality of the material has resulted where foreign steel has been imported by consumers in this country. A buyer here much prefers to pay higher for American billets than to undergo the uncertainties in taking German or English billets at a lower price."

Mr. Samuel believes the technical situation of ferro-manganese is strong. "The price of manganese ores abroad has gone up considerably. The low priced era of Russian ores is over. I doubt whether we will ever again see as cheap ores as in the recent past," he says.

D. F. Bush, senior partner of Crocker Brothers, New York City, has returned from an European trip.

IRON AND STEEL MARKETS

Decreased Buying of Nearly All Steel Products

And Prices Show Many Irregularities—Pig Iron Market Generally Dull, But Southern Prices Still Tend Upward—Concessions in Coke

BY GEORGE SMART

Mills in the Chicago district have been encouraged during the past few days by the heavy specifications received from car companies and by increased demand for structural material, while the buying of pig iron in that section also shows improvement. These conditions are, however, exceptional and in nearly all parts of the country there seems to be a slackening of business, with many price irregularities. The strong feature continues to be the heavy consumption.

Pig Iron

The southern situation still gains in strength and very little iron is now obtainable at less than $11.50, Birmingham, for No. 2. In the north, however, furnaces have great difficulty in advancing prices. Steel-making irons particularly are dull and transactions in basic are almost unheard of. Malleable is somewhat stronger in the Pittsburgh district, a round tonnage having been sold at $14.50, valley. In eastern territory, there is less activity and the largest transaction of the week was the purchase of 9,700 tons by the Pennsylvania railroad for its Altoona plant. Consumers of ferro-manganese have been hesitating apparently on account of tariff uncertainties, but inquiry for from 3,000 to 4,000 tons is now pending.

Coke

Negotiations for furnace coke for October consumption have been opened by a number of buyers, some of whom have already closed. One eastern interest has bought part of its October requirements at $2.50, ovens, but another eastern furnace has closed for 5,000 tons of October coke at a price not announced. While leading producers are refusing to shade $2.50, ovens, others are willing to sell both prompt coke and for the remainder of this year at $2.25, and at least one seller has offered to shade $2.20 slightly.

Steel Bars

The steel bar market is about the strongest feature of finished materials, as prices are being adhered to and demand continues fairly active. Even the railroads, which are so slow in buying other kinds of material, are placing orders for bars. There is a very strong demand for reinforcing bars for concrete work. The Jones & Laughlin Steel Co. has taken 2,400 tons for government reclamation work awarded at Portland, Ore. The requirement of the Massachusetts School of Technology, which will amount to about 5,000 tons of reinforcing bars, will probably test the market.

Structural Material

A large volume of business in structural material is pending in different parts of the country, but it comes to the contract stage very slowly and often there is keen competition among fabricators. In the Philadelphia district, as low as $40, delivered, has been done on important work. In the Pittsburgh district, from 15,000 to 20,000 tons are pending, but a considerable part of the tonnage is rather indefinite. The 1,500 tons required for the buildings of the Anaconda Copper Co., Anaconda, Mont., have been awarded to the Jones & Laughlin Steel Co. The Lackawanna Bridge Co. has taken 2,000 for the Union Carbide Co.'s plant at Welland, Ont. Half of the 4,000 tons required by the Michigan Boulevard building, Chicago, will be furnished by the Illinois Steel Co. and half by the Bethlehem Steel Co. The fabricating will be done by the Chicago Steel Products Co.

Tubular Products

Low prices are being named in competitive business on cast iron pipe. The Warren Foundry & Machine Co. were awarded 6,500 tons by Lynn, Mass. A reduction of the price of boiler tubes before many weeks is predicted in some quarters. Some of the leading makers of lap-welded steel pipe are unable to give prompt delivery.

Railroad Buying

Buying by the railroads continues very light, but there is a growing feeling that the Interstate Commerce Commission will grant the petition of the railroads to advance freight rates 5 per cent. This feeling, which seems to be well founded, gives reason for hoping for a large increase in buying by the railroads at a not far distant date. The announcement of the closing of negotiations for rails for two large systems for next year is expected shortly. Several lots of 2,000 to 3,000 tons for this year's delivery have been placed.

Very Little New Business at Pittsburgh

Strenuous Efforts Clinch Price Declines in Finished Materials—Considerable Structural Tonnage Pending

BY C. F. WILLIAMS

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg.,
Pittsburgh, Sept. 23.

Despite prolonged inactivity, prices of the heavier finished lines have been held satisfactorily this month, and every effort is being made to prevent future reductions in quotations. Steel sheets continue to show irregularity, and existing conditions have made it practically impossible for manufacturers to establish definite price levels. Demand for bridge and structural material is comparatively heavy, it being estimated that between 15,000 and 20,000 tons are involved in pending inquiries, many of which, however, are indefinite in nature. With the probable approval of a proposed 5 per cent increase in freight rate, it is believed railways in the east will figure prominently in a car-buying movement, which would steady the general market for plates and shapes.

Pig Iron.—September is proving to be one of the quietest months in the year, and sales have been so infrequent that prevailing quotations are considered nominal. Standard basic, being held at $14.50, valley, by several dealers, has been unusually quiet, and consumers are inclined to believe it still is available at $14, valley. A 200-ton lot of malleable-basic this week sold at $14.50, valley. Foundry and malleable grades are not commanding above $14, valley, in competitive bidding, although small lots have sold as high as $14.25. Considerable interest is being taken in 1914 foundry and malleable, but no sales have been made in this district.

Ferro Alloys.—Some dealers consider ferro-manganese strong at $56, seaboard, but others are inclined to believe tonnage still is available at $55. Lower grades of ferro-silicon are quiet and somewhat irregular.

Plates and Shapes.—It is roughly estimated that between 15,000 and 20,000 tons of structural material are involved in pending inquiries, but some uncertainty is attached to many of the projects under consideration. Mills are receiving numerous inquiries for prompt material, but there is practically no buying for future shipment, and rumors of price cutting are heard. Car builders hope to enjoy activity within the next 30 or 60 days; a car buying movement at this time would tend to steady the general market.

Sheets.—Wide spreads in quotations have disappeared this week, and minimum price reductions have been made in one instance. Continued irregularity has made it difficult to maintain what are known as "market prices" and some manufacturers say they have no regular quotations at this time. Buying has been fairly heavy and several consumers have attempted to cover first quarter needs. Makers have declined to sell beyond the end of the year at present prices. Mills are not being driven so hard as a week ago, although curtailment in production is slight.

Rails and Track Material.—Railways in the east have not yet figured in the market for 1914 requirements, although estimates are being made and appropriations considered. Except for supplemental buying, the market for rails and track material is quiet, but there are no changes in prices.

Billets and Sheet Bars.—No sales of importance have been made this week, and prices are somewhat uncertain, although leading makers continue to hold sheet bars and billets at $26 and $25, respectively, at the mill. Some tonnage, obtained through sliding scale contracts made earlier in the year, is being shipped at rather low prices and is indirectly responsible for lower prices on finished products.

Hoops and Bands.—The market is quiet, although specifying continues at about the rate prevailing last month. Hoops are being held at 1.60c and bands are firm at 1.40c.

Iron and Steel Bars.—Steel bars, by all means, are the strongest item on the list. Specifying the first 22 days of this month was almost equal to that during the corresponding period in August, and new buying has not fallen off. Iron bars are somewhat irregular, it being possible to obtain an attractive tonnage at a slight concession.

Muck Bar.—Leading mills employing United Sons of Vulcan have been idle about 75 days, and some scarcity of muck bar is reported. In the absence of sales we quote this material nominally at $31, Pittsburgh.

Tubular Goods.—Some of the leading makers are unable to offer lap weld steel pipe for anything like prompt delivery. An inquiry for 8 miles of 16-inch steel pipe is before the trade. Demand for boiler tubes continues satisfactorily, and discounts are being well maintained.

Tin Plate.—The market is quiet, and no further weakness has been noticed. Buying for next year's requirements probably will not begin for three weeks or a month.

Wire.—A fortnight ago, it was rumored nails were offered at 1.60c, but that quotation was withdrawn a day or so later and the market since that time has been fairly steady. Leading makers are refusing to shade current prices, and continue to take tonnage at current quotations. The general wire market reflects more strength today than a week or ten days ago.

Wire Rods.—The bulk of the tonnage continues to be sold at $27.50, Pittsburgh, although small lots have been bought at $28 recently.

Coke.—The market is quiet, and no attempt has been made to obtain October fuel. Leading shippers are holding standard coke at $2.50, ovens, and will not shade that figure for October, it is claimed. It is not improbable that best grades will command $2.50, although some fuel probably will be offered at $2.25, depending upon analysis. The Connellsville *Courier*, for the week ending Sept. 13, says production was 374,810 tons, an increase of about 5,000 tons compared with the week before. The increase was made by Corporation ovens.

Old Material.—The market reflects no improvement. Conditions are decidedly dull, and prices are not so strong as a week ago. Middlemen do not expect to experience activity until the market for finished products becomes more certain.

Denies Low Price

The Republic Iron & Steel Co., Youngstown, states that the report that it is quoting 1.40c, Pittsburgh, on such sizes of structural material as it makes in competition with the regular structural makers, that is, angles of from 3-inch to 6-inch sizes, is not correct.

At the Erie, Pa., works of the General Electric Co., the new four-story, 200 x 400-foot addition to the machine shop will be opened at a public reception by the Employes' Mutual Benefit Association, Tuesday evening, Sept. 30. All of the new machines will be demonstrated. Dancing will be provided for the young folks.

Larger Volume of Business at Chicago

Mills Encouraged by Heavier Specifications, But There Are Still Some Uncertain Factors—Pig Iron More Active

BY H. COLE ESTEP

Office of THE IRON TRADE REVIEW,
1521-23 Lytton Bldg.,
Chicago, Sept. 23.

The volume of business shows appreciable improvement and it is felt by some that the long-looked-for fall revival of buying is at hand. Steel makers have been encouraged by liberal specifications from car companies and by a steady volume of structural business from fabricators; in addition, the blast furnaces report larger sales of pig iron and firm prices. On the other hand, it must be recognized that steel buying has been stimulated only through a reduction of from $1 to $3 a ton, and it is questionable whether new business will increase to the full capacity of the mills without further price readjustment. There is good evidence that the heavy specifications for car building material received recently have been accepted at 1.40c, Pittsburgh, covering both plates and shapes.

Pig Iron.—Following a most inactive week, the pig iron market has picked up slightly. It is evident that the foundry melt is increasing to some extent, and that not as many consumers are fully covered for this year as had been imagined. There has been considerable buying of southern iron for prompt shipment, including 300 tons purchased by a Chicago stove foundry at over $11, Birmingham. The International Harvester Co. also, it is reported, has purchased 1,000 tons of southern iron for prompt shipment. The Western Electric Co. is inquiring for 200 tons of high silicon iron. Although several southern producers are advancing their quotations, it is still possible to obtain iron for prompt shipment at $15.35, Chicago. Shipments from the local furnaces have been exceedingly heavy during the past 30 days.

Merchant Bars.—Bar iron specifications are fairly satisfactory and the proportion of railroad business shows a slight increase. Quotations, however, remain low and it is understood that in some instances sales have been made at 1.32c, Chicago. Mills holding agricultural contracts for steel bars are greatly encouraged by the volume of specifications. In fact, steel bars are one of the strongest features of the market. No sales of steel bars have been reported at less than 1.58c, Chicago. Sales of shafting are moderately good. A Pittsburgh steel company will furnish 2,400 tons of ⅝-inch steel rounds for a government reclamation project in the far west. Owing to foreign competition on the Pacific coast and other factors, a low price was made.

Plates and Structurals.—For current business, quotations on beams and other structural shapes remain at 1.45c, Pittsburgh, but in a number of instances recently where bidding on certain structural jobs was keen, tenders at $1 a ton less have been made. The Chicago market on shapes may be fairly quoted at 1.58c to 1.63c. There are no new developments in the plate situation and prices are stable at 1.40c, Pittsburgh. The Illinois Steel Co. will furnish half of the steel for the Michigan boulevard building which will be fabricated by the Chicago Steel Products Co. The total involved in this contract was about 4,000 tons. The building was originally designed for Bethlehem sections, but it was finally decided that the Bethlehem Steel Co. would furnish only the columns, about 2,000 tons, leaving the other half of the steel to be supplied by the local mills.

Rails and Track Fastenings.—There have been no further advances by the larger western railroads regarding their 1914 requirements. Western makers are encouraged by the receipt of a number of fair-sized orders for standard sections for shipment during this year. The Illinois Steel Co. has booked a contract from the Trona railway in California for 4,000 tons of Bessemer rails. There have also been some encouraging orders for tie plates recently. In general, however, track fastenings are quiet. There is a fair demand for light rails. The Southern Pacific has specified for 15,000 tons of rails from the Tennessee Coal, Iron & Railroad Co.

Bolts, Nuts and Rivets.—Structural rivets are lower, some sales having been made at 1.95c, Chicago. Otherwise there are practically no new developments in the situation. Specifications against agricultural contracts are reported fair. Liberal concessions are being made on small bolts for carriage and automobile builders.

Sheets.—The sheet market is apparently without a bottom and each week witnesses new low prices. Sales of No. 28 galvanized have been made in the west on a basis equivalent to 3.12c, Pittsburgh, or 3.30c, Chicago. Black sheets are equally soft. The cooler weather has increased production and prompt mill deliveries are the rule. The western mills continue to operate at practically 90 per cent capacity.

Wire Products.—Orders for the output of the western wire mills are well distributed and fairly liberal specifications are being received both from the agricultural and manufacturing sources. There are no further reports of lower prices and the trade has assumed a substantial footing. Orders have been booked running well into the future. It is doubtful, therefore, whether there will be any material changes in quotations for this year.

Cast Iron Pipe.—There were no lettings of consequence in the west during the past week. On Sept. 29 the fire commissioners of Detroit will open bids on 300 tons of special water main. Dayton, O., will award a contract for 170 tons on Sept. 26. Bids were opened at Kansas City, Kans., Sept. 23 for 200 tons of water pipe. The leading interest is maintaining its quotations, but the independents are making any prices which they think necessary to obtain business.

Merchant Pipe and Tubes.—Some improvement in the sale of small steel pipe is expected, owing to the increased building activities which always precede the approach of cold weather. Specifying against tube contracts continues heavy and some new business is being booked. Discounts are well maintained.

Old Material.—A flood of wrought scrap has been released by the railroads, and as a result No. 1 railroad has slumped to a minimum at $9.75 per net ton, Chicago. Over 2,500 tons of No. 1 wrought are included in various railroad lists thrown on the market recently. The Illinois Central alone had 1,000 tons and the Burlington 500. The Illinois Central list aggregates about 3,500 tons and the Burlington list about 2,500. The estimated consumption of wrought iron in the Chicago district is not over 3,000 tons per month; practically 30 days' supply has been placed on the market in a block. Busheling scrap is also weaker. Rerolling rails are holding fairly well at present.

Low Furnace Coke Prices at Cleveland

Some Ovens Willing to Contract for Remainder of Year at $2.20—Light Rails Active—Steel Bars Active

BY GEORGE SMART

Office of THE IRON TRADE REVIEW,
Penton Bldg.,
Cleveland, Sept. 23.

Iron Ore.—The violent gale which swept over Lake Superior on Saturday and Sunday demoralized shipping completely, sending the largest carriers into shelter and delaying the ore-carrying fleet about 30 hours. Heavy weather appears to be setting in early this fall and, with the delay caused by the strike on the Allouez dock, vessel owners are behind on their ore schedules and will have no chance to enter the grain trade as they had hoped. The fleet may expect delays due to the elements from now on, but there is no question of its ability to bring down 50,000,000 tons this season. All the fleet has to do to accomplish that is to move as much from now on as it moved during the corresponding months of last year. This can readily be moved on contract tonnage and, in fact, all that the shippers are trying to do is to keep contract tonnage busy. The September movement will in all probability be well over 7,000,000 tons.

Owing to the quiet condition of the pig iron market, there is no prospect that there will be any considerable buying of ore this fall. Ore men say that unless more ore is bought, shipments will show a considerable decrease, for the reason that unsold ore will not be shipped.

Pig Iron.—The market is very dull, especially in steel-making irons. The outlook for the foundry grades is somewhat better, with prices being firmly adhered to and some interests asking more than current quotations. The strong feature of the situation is the continued heavy consumption by foundries, which are demanding that shipments be made as rapidly as possible. There is some complaint about a shortage of cars.

Coke.—The furnace coke market has developed more weakness and some sellers are offering to contract for the remainder of the year at $2.20 and $2.25, ovens. Others are still asking $2.50. There is a shortage of cars and some coke is being shipped in open cars.

Finished Material.—Light rails are the most active and steel bars the strongest materials in finished lines. Numerous inquiries have been sent out for light rails and a good many sales have been made, but prices are very irregular. On steel bars the 1.40c, Pittsburgh, price is firmly adhered to. We note one sale of about 2,000 tons at full prices. There is fair activity in structural material. Bids on both the Taylor addition, 750 tons, and the car repair shops of the Cleveland Railway Co., 800 tons, will be received Thursday. The American Bridge Co. will begin next week the erection of the eight open-hearth furnaces of Corrigan, McKinney & Co., for which the foundations have been completed. It is expected that about nine months will be required to finish this new construction. The firm has decided not to proceed with the erection of the finishing mills, at least at the time expected. It is understood that a considerable part of the product of the steel plant will be disposed of as hot metal to another company. The firm has let the contract for a bridge across the Cuyahoga to the American Bridge Co. It is the bascule type and will require about 400 tons of shapes. The construction of the open-hearth furnaces will require about 15,000 tons of steel.

Old Materials.—Further declines were noted in the prices of several grades of scrap in the local market during the past week. Business has been very dull, most of the large consumers being practically out of the market. The absence of the Upson Nut Co. from the market has hurt the price of heavy steel. The upturn, for which the dealers waited during most of the summer, came, with a slight hardening of prices, but lasted for only a brief time; the present reaction has carried prices to a lower level than they have been for several years. Brokers and dealers generally are pessimistic.

A. E. Manchester, superintendent of motive power for the C., M. & St. P. Ry. Co., in charge of the West Milwaukee shops, states that since Jan. 1 the shops have constructed 65 locomotives of the consolidation and Mikado types, and 3,500 freight cars. The shops are preparing to start on an order for 25 consolidation and 10 Mikado type locomotives. Of the 2,000 men now employed, 37 per cent are engaged in new work, the remainder devoting their attention to repair work.

SOUTHERN PIG STRONG

During a Quiet Week—Stock is Being Gradually Reduced.

BY W. B. NEAL

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., Sept. 23.

Pig Iron.—The pig iron market has been quiet for the week just past. Orders aggregating some 9,000 tons were entered for delivery during the fourth quarter, 4,000 tons of which was for strictly competitive territory and placed at $11.50 per ton, Birmingham, No. 2 foundry, basis. One lot of 1,000 tons, car lots and 100-ton lots aggregating another 1,000 tons was booked for southern territory delivery during the last quarter. Some 3,000 tons of special analysis coke iron and charcoal iron were entered in lots of 250, 500-ton and 1,000-ton lots for last quarter, these brands of iron taking a premium, according to analysis, varying in price from $13 to $24 a ton, respectively. It is now understood that all of the producing interests are maintaining the $11.50 per ton price for No. 2 foundry, Birmingham. One large interest has advanced its price to $11.50 per ton basis only recently. No tonnage as yet is reported having been entered for the new year, and rumors to this effect fail of confirmation. The stocks on yards are being reduced very perceptibly; and without any interruption in shipments, stocks will be very small by Dec. 1. The entire make is being forwarded.

Cast Iron Pipe.—No new orders of much importance are reported in this line of manufacture, but plants all continue to operate with about three-quarter force. The larger part of the make is being carried, and stocks are growing to good, large sizes, yet there is some business all the time, and small shipments go forward regularly. Specifications are numerous and the feeling is strong that large orders will be entered as soon as the necessary floating of bonds, which were voted for improvements requiring this line of product, shall have been accomplished.

Old Material.—While the market has been somewhat disappointing as to the volume of business, yet no change in prices is authorized. The dealers continue to add to their stocks and the general tone is better. Sales are confined to car lots and 100-ton lots, yet there is an increased movement of this class of material over that prevailing some weeks past. Transactions for the week involve something like 600 tons.

Southern Prices Gradually Advance

With Very Little $11 Obtainable—Considerably Higher Quotations for Next Year by Some Furnaces

BY S. G. BACKMAN

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg.,
Cincinnati, Sept. 23.

Pig Iron.—The southern market is gradually advancing from $11 to $11.50, Birmingham basis, for No. 2 foundry iron, and unless something unforeseen develops soon, this latter price will be general for the last quarter in both Tennessee and Alabama. Most furnaces in Alabama are at present on the $11.50 basis, but there is still some $11, Birmingham, basis iron to be had in Tennessee and probably a little in Alabama, mostly for nearby shipment. There is consequently a better feeling, especially among the furnace operators, who, in some cases, have refused to quote beyond the first quarter of next year, deciding to wait until they can apparently judge the future of the market better before going into the second quarter. This strength has not come from transactions in this territory, either previous or at the present time, as the market is rather quiet, and except for occasional spurts, has been so for some time. Large tonnages, however, have recently been sold by southern furnaces into surrounding territories. Buyers, on the other hand, are none too anxious to purchase beyond the first quarter, as this year the market declined steadily after the first of the year, and those who had contracted for the whole first half have consequently decided to be more conservative this year. The general quotation for the first half is $11.50, Birmingham, but one and possibly two furnaces are holding firmly at $12, Birmingham, for the first quarter.

The southern Ohio situation has not shown the strength proportionately of the southern. Fourteen dollars, Ironton, is still the leading quotation for the last quarter for No. 2 foundry iron. Quotations into the first half are not very general, but $14.50, Ironton, could probably be done in most instances.

There is an inquiry here for 1,000 tons of northern and 1,000 tons of southern foundry iron from a central Indiana melter, and another for 750 tons of northern and 250 tons of southern foundry iron from the same part of the state, both for first half shipment.

Coke.—A large Wise county producer is asking $3.50, ovens, for foundry coke for any delivery, but the general price is probably $3. One interest will take $2.75, ovens, for either spot or contract shipment. Any prices below these are probably not on standard brands. The decline in the Pocahontas fields, about a week ago, has had no noticeable effect upon that market, which is still very strong, as this decline was brought about by certain ovens desiring to dispose of surplus coke and coal, rather than by a weakening of prices, which has not occurred. Prices during the past week have not changed in any of the fields, and are fairly strong. It is probable that the consumption and production are about even at the present time. Most of the foundries in this territory have closed for their requirements up until next July, but the furnaces are expected to be in the market within the next 30 or 60 days.

Finished Material.—Warehouse business appears to be somewhat spotted, as some of the warehouses report a good business during the past week, and others that orders have been rather scarce with them recently. The railroads have taken a large amount of re-inforcing bars and there is also a good demand for small structurals for light work. Steel bars are generally being held at 2c by the larger warehouses, but some of the smaller ones will quote 1.95c, Cincinnati. Iron bars are quoted at from 1.85c to 1.90c, Cincinnati, by most dealers, the higher price being probably the most general. Shafting is unchanged from that of last week, when prices on it were reduced from 50 off to 53 off.

The local sheet market is good as far as new business and specifications are concerned. The local mill is from eight to nine weeks behind on deliveries, and the prospects of earlier shipments are not bright, as it has been unable to secure steel in satisfactory quantities for some time. From the general outlook, also, a good fall business will result which will keep the demand and production equalized for some time.

Old Material.—The continued quietness that has been characteristic of the scrap iron market here for several months has caused prices to remain unchanged during the past week. There is a better feeling generally among both the buyers and sellers, especially the latter, but actual transactions are far from satisfactory. This better feeling is probably due to the fact that since the settlement of the recent local strike, which for a time seriously handicapped the scrap iron business, the dealers have been busy filling orders that accumulated during that time. The general outlook is that there is a large surplus of scrap available in comparison with the demand, and until this is used up to a certain extent, the market will not be advanced much. Prices are very uncertain.

MODERATE SALES

In St. Louis Territory—Two Lots of 1,000 Tons Each of Pig Iron.

BY E. C. ERWIN

Office of THE IRON TRADE REVIEW,
St. Louis, Sept. 23.

Pig Iron.—Dealers seem to be playing a waiting game, believing that prices will change one way or the other, but early shipments are in great demand. This is taken to indicate that stocks are being used up, and that buyers will be in the market again. The furnaces also are holding out for better prices, and are not seeking business for next year. Southern No. 2 seems to be firm at $11.50 for prompt shipment and $12 for fourth quarter and early next year. A sale of 1,000 tons of malleable for delivery in St. Louis during the first half and 1,000 tons of Southern No. 2 for delivery at Quincy, Ill., this year and first quarter were made.

Malleable is quoted at $15 to $15.50, Chicago. Northern iron is firm at $15, Chicago, and $14.50, Ironton. Several carload lots were closed late last week, and the inquiry for 2,000 tons of northern basic, reported last week, was sold Thursday in Chicago for shipment to Davenport, Ia.

Coke.—One inquiry for 2,000 tons of furnace coke is out and probably will be closed this week. With this exception new business is very scarce. Connellsville 72-hour foundry coke is held at $3 to $3.25; Connellsville 48-hour furnace coke at $2.50; Virginia 72-hour foundry grades at $3 to $3.25; Virginia 48-hour furnace at $2.35 to $2.50.

Old Material.—Conditions in the scrap iron market are decidedly discouraging, owing to the large amount of scrap the railroads are offering for sale. The Illinois Central is out with a list of 8,000 tons of scrap to be closed Tuesday; the C., B. & Q., one for 3,000 tons, and the Grand Central one for 5,000 tons, both to be closed Wednesday. Relaying rails are in strong demand, with a still further reduction in the supply. Prices of scrap are not changed.

Eastern Buying Below Mill Capacity

Plants Have Few Orders on Hand—Pennsylvania Railroad Buys Round Tonnage of Pig Iron—Furnace Coke Selling at $2.25

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
326 Real Estate Trust Bldg.,
Philadelphia, Sept. 23.

The predominant note in the eastern finished steel situation is the quietness of new buying. New business is not over 75 per cent of eastern mill capacity on the average. The depletion of order books is more pronounced where makers depend heavily upon railway patronage, as the latter is now extremely small. Certain mills of some large plants have only about three weeks' rolling ahead. Pig iron buying is less active, but the market is well grounded on recent liberal bookings by the furnaces and prices show strength. Price improvement is coming slowly in old material and buying remains restricted.

Pig Iron.—Selling of iron in eastern Pennsylvania districts has been along quieter lines the past week, but the market maintains a healthy aspect and prices show strength. Stocks on furnace banks are declining and the percentage of standard grades on hand among eastern Pennsylvania producers is now quite small while the misfit iron is being more actively absorbed by certain buyers, including the cast iron pipe makers. A few brands of eastern No. 2X are still selling in the range of $15.75 to $16, delivered, in the Philadelphia district, but most of the tonnage is going at $16 to $16.25, delivered, and a small portion is selling higher. The Pennsylvania railroad has closed upon its inquiry for last quarter delivery at Altoona and is believed to have taken the maximum quantity of 9,700 tons, divided into 4,600 high silicon and 2,400 low silicon coke iron and 2,700 of charcoal iron. The coke iron went to central and western Pennsylvania and the charcoal to Lake Superior and southern makers. Pipe iron sales were small, reaching 1,000 to 2,000 tons, usually at $15, delivered. The Standard Cast Iron Pipe & Foundry Co. is still negotiating for 5,000 tons of forge and No. 3. Standard northern forge now appears at a minimum of $15, delivered. Virginia iron continues to move at $13 to $13.25, furnace, for No. 2X. The Virginia Iron, Coal & Coke Co. is about to blow in another furnace and the Covington stack will soon go in. Basic iron in the east is undoubtedly stronger and the minimum is around $15.25, delivered. Some additional tonnage for forward delivery has been taken, but details are lacking. One buyer this week was making offers on a small additional lot of basic. About 500 tons of October malleable is wanted by a local buyer. There is an inquiry for 1,000 tons of low phosphorus out in this district and another of equal size for a Columbus, O., buyer. Sales of 400 to 500 tons of Lebanon low phosphorus at $18, furnace, and about the same tonnage of standard iron at $23 to $23.50, Philadelphia, are reported.

Coke.—Eastern buyers of furnace coke continue to make purchases of standard Connellsville fuel at $2.25, ovens, for prompt delivery. One buyer reports having been offered prompt Connellsville coke, guaranteed below 1 per cent in sulphur, at a shade below $2.20, ovens.

Iron and Steel Bars.—Some betterment of tonnage taken has been experienced by eastern Pennsylvania bar iron makers the past few weeks. Prices, however, still remain at the range of 1.25c to 1.35c, mill, depending upon the brand. The steel bar market remains quiet and specifications are more sluggish. Deliveries in October are being promised by some mills. Prices remain at 1.40c, Pittsburgh base, but reports that extras are sometimes waived or shaded, still persist.

Plates.—New business with eastern plate makers is less active. One maker who has been entering capacity tonnage reports a lighter volume last week. The absence of railroad buying is being felt by makers, who generally are able to run only on partial schedule and can make deliveries, if necessary, in a week. Small orders predominate and these are usually taken at 1.45c, Pittsburgh, or 1.60c, Philadelphia, but on the larger lots 1.40c, Pittsburgh, is being done. This is believed to be minimum. A large tonnage of plates for pending boats is in sight, but the steamship interests are slow to make awards to builders. The Clyde Steamship Co. is taking figures on three freight and passenger boats which will require 1,500 to 2,000 tons of steel each.

Structural Material.—The 1.40c, Pittsburgh, or 1.55c, Philadelphia, price on structural shapes is now being quite freely done in eastern districts on lots of fair size. Some reports of lower than 1.40c are current, but these cannot be established. All the eastern mills show declining order books and lighter operations, but some are more aggressive for tonnage than others. New business is comparatively light.

Sheets.—A fair movement in heavy sheets is being sustained in eastern Pennsylvania districts, but new business is practically all for quick delivery. Makers usually are able to maintain their prices on the basis of 1.65c, Pittsburgh, or 1.80c, Philadelphia, for No. 10 gage.

Semi-Finished Steel — An eastern Pennsylvania consumer has been informally figuring on 5,000 tons of billets, but is in no hurry to close. The market shows little activity on new tonnage. Prices remain about $25 to $26, delivered, in this district for rolling, and about $5 higher for forging billets.

Old Material.—The market is still inclined to drag, as consumers generally are not active buyers and the expected price improvement is not materializing very rapidly. Dealers show considerable activity among themselves, but are still cautious to commit themselves on large lots except at advances. There has been no important buying of steel since the heavy purchase by a Coatesville consumer previously reported. This buyer, it is now learned, closed for a total of 20,000 tons and the highest price paid was $12, delivered. Heavy cast is in good demand. A local buyer took 1,000 tons of low-phosphorus scrap at a reported price below $15, delivered.

Historic Plant Dismantled

The plant of the Tyrone Iron Co., at Tyrone Forges, Pa., has been acquired by Michlovich & Co., of Harrisburg, dealers in old material, and now is being dismantled. This plant has been numbered among the historic charcoal bloomeries of the Juniata Valley in eastern Pennsylvania. The forges were first established in 1809 and rebuilt in 1870. A rolling mill of two trains was added in 1883 and enlarged in 1898. The product of the works was sheared and grooved rolled iron and steel skelp, and a specialty was made of knobbed charcoal iron boiler tube skelp. The plant of the Tyrone Iron Co. was formerly controlled by Robert C. Neal, of Harrisburg, and associates. Mr. Neal died a few days ago.

Pig Iron Buying at New York Subsides

With Sales Aggregating Only a Few Thousand Tons —Advance in Railroad Freight Regarded as Probable

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
503-4 West St. Bldg.,
New York, Sept. 23.

Pig Iron.—The recent activity in buying shown throughout this district has now subsided for the time being. The probability of success for the railroads in petitioning for a 5-cent advance in freight rates in eastern territory, is attracting more attention among consumers. In some cases, the latter are holding off from closing until they can be assured of their delivered iron costs several months in the future. Aggregate sales of the past week in this territory reached only a few thousand tons. One seller reports sales of about 4,000 tons, largely non-competitive. A Brooklyn buyer took 600 tons of high silicon iron from Buffalo makers. The Essex Foundry Co., Newark, still is figuring on 1,000 tons of Nos. 2 plain and 3 for last and first quarter, and Abendroth Brothers, Port Chester, N. Y., have opened an inquiry for 2,500 tons of No. 2 southern for first half. Some Jersey buyers were still able to do $15.75, delivered, for No. 2X in the week, but this price is exceptional and $16, tidewater, is usually the minimum, with some sales going considerably higher. Buffalo iron seems firm around $14.50, furnace, for No. 2X, for last or first quarter and higher has been quoted in silicon under 2.25. The leading Virginia maker, about to put in another furnace, is more inclined to sell and is quoting No. 2X at $13.25, for this year. An export inquiry for 2,000 tons for the Orient, appeared in the week.

Ferro-Alloys.—Consumers of ferromanganese who have been holding off from buying through tariff uncertainties now are apparently in greater need for material, as inquiries aggregating 3,000 to 4,000 tons have been put out. A considerable part of this for early shipment. The total is made up of lots of 600 tons and less, and about 1,000 tons is for the Chicago district. Strike troubles at Liverpool seem to be a factor in firming up the prompt market. Some sellers who have been shading $56, seaboard, are not getting shipments promptly as a result of this strike, and have been obliged to buy lots for immediate shipment from their competitors at full prices. Some leading sellers emphasize the strong points of the market, but it is evident that some interests will still speculate at concessions for forward delivery.

Plates.—A boiler manufacturer in this district recently has closed for 2,000 tons of plates for shipment over the remainder of the year. A price of 1.40c, at least, was obtained and it is reported that lower was done on part of the business, but this is not confirmed. The plate market is quiet and sales usually are small. Eastern makers are now promising deliveries within a week. Dull railroad buying of cars and other lines is clearly reflected in the market. Prices range from 1.40c to 1.45c, Pittsburgh, or 1.56c to 1.61c, New York, depending upon the attractiveness of the order.

Structural Material.—Operations of structural shape makers, particularly in the east, continue to be sustained by day-to-day buying of odd-lot character. The activities of these plants fluctuate from week to week at from 60 to 75 per cent of activity, depending upon the tonnage received. Prospects for tonnage in this district are pretty fair, but work is being released slowly, due to tight money and general caution. Some reports that lower than 1.40c, Pittsburgh, or 1.56c, New York, are being done, are current, but these remain to be corroborated. Buyers have little difficulty at present to obtain 1.40c, Pittsburgh, on the larger orders, but a scattered tonnage is still going at 1.45c, Pittsburgh.

Cast Iron Pipe.—As the order books of makers in the eastern district are running down, they are coming into the market one after another, are naming such prices as are quite sure to obtain the order for them and then are retiring for the time being. Prices, because of this, remain irregular and fall within a wide spread. The common price at which attractive work has been recently going has been about $19.50, at the foundry. The Warren Foundry & Machine Co. has taken 6,500 tons of 4 to 36-inch pipe for Lynn, Mass., at about this price, or $21.50, delivered. The Beaver Engineering Co. is the low bidder on 2,200 tons of 6 to 20-inch for Queens. Bids go in this week on about 800 tons of 6 to 8-inch pipe for Manhattan and Brooklyn.

Iron and Steel Bars.—The Jones & Laughlin Steel Co. has taken 2,400 tons of ⅝-inch rounds from the government for reclamation projects in the far west. Stone & Webester, Boston, who have been figuring on 1,000 tons of reinforcing bars for the Massachusetts Institute of Technology are expected to increase this total to 5,000 tons. Since these bars are for prompt shipment, they are expected to afford a genuine test of price strength. At present, the market seems quite firm at 1.40c. There is only a fair demand for iron bars at unchanged prices.

Old Material.—A little better tone to the market, which was apparent for a few days last week, following the purchase of a large block of heavy melting steel by the Lukens Iron & Steel Co., now is less in evidence. Sales have dropped back largely to specialties and day-to-day transactions are small. Dealers are furnishing the principal activity. Slightly higher prices have been obtained for cast scrap.

BUFFALO PRICES

Are Easier on Pig Iron—Some Foundries Not So Busy.

BY FRANK R. DOLBEE

Office of THE IRON TRADE REVIEW,
Buffalo, Sept. 23.

Pig Iron.—Furnaces are hopeful, but prices are slightly easier than they were a week ago. Some interests have softened the price of No. 1 foundry to $14.50, but the others are holding to the maximum of the range quoted last week on this and other grades. The quieter market is said to be due to the tariff and currency situation at Washington. While the buying has moderated, the demand from customers under contract for shipments is pronounced. Many melters are wiring the producers to rush forward the iron specified. On the other hand there are a number of foundries that have asked to have deliveries withheld temporarily, dividing the market into two groups of users—those desirous of marking time and those bringing all sorts of pressure to bear upon the furnaces to get out their requirements of iron for immediate consumption. One interest is reported to have booked No. 2X foundry at $14 to $14.25, but these transactions were not sufficient to alter the schedule of $14.25 to $14.75 quoted last week and this week.

Finished Material.—The principal feature of the market this week is the volume of structural tonnage due to come out between now and the first of the year. Fabricators report that fully 15,000 tons for local construc-

tion work will be contracted for, above the average run of placement. This includes between 8,000 and 9,000 tons for the Lackawanna's new passenger station and overhead approaches; 1,500 tons for the Lehigh's viaduct changes over its new station approach; 1,400 tons for the new South Side high school; 400 tons for the new Moeller hotel and other jobs on the boards and soon ready for bids.

Inquiries have improved on miscellaneous lots in the past two weeks and new business is holding its own in the general lines of bars, shapes and plates. The wire market is stronger and the principal and independent interests are placing a large volume of business at 1.45c, base, on wire, and 1.65c, base, on wire nails. Fully 1,800 tons were placed by one interest. The inquiries that are coming in are not of a "sounding" character, but are materializing into booked orders in the various lines. There are no large tonnages coming out for the stock sizes, but the assorted lots total a normal tonnage. Specifying is being carried on more freely and deliveries are being made on all except certain sizes, in from four to six weeks, but principally for November delivery.

Old Material.—Prices remain the same as quoted last week, but the market is reported by both consumers and dealers to be in an unsettled shape. There continues to be no local demand for heavy melting steel and the only activity apparent is in turnings and borings, coming from the Pittsburgh district. The local consumption on cast scrap is holding its own but the remainder of the list is practically inactive.

English Stocks Decline

New York, Sept. 23.—Stocks of pig iron in Connal's store, Middlesbrough, England, on Sept. 11, amounted to 179,360 tons, a decline in the week of 3,780 tons, and a total decline in the year of 62,263 tons. Furnaces in blast in the Middlesbrough district on that date were 88, against 89 a week ago and 85 on the corresponding date in 1912. Stocks of iron in the Cumberland district, on Sept. 11, were 18,829 tons, a decline in the week of 772 and for the year to date of 17,594 tons. Furnaces in blast number 24, which was the same last week, as compared with 25 on the corresponding date a year ago.

Lewis N. Lukens, manager of the finished iron and steel department of Matthew Addy & Co., Philadelphia, will sail about Oct. 1 for a tour of continental Europe.

ROAD BUILDING

Will be Discussed by Bankers and Many Others.

The Third Annual American Road Congress will be held in Detroit, Sept. 29 to Oct. 4, under the auspices of the American Highway Association, the American Automobile Association and the Michigan State Good Roads Association. One of the most comprehensive programs ever formulated for discussion at a conference of road men has been prepared, and an attendance of delegates breaking the record of over 2,000 at Atlantic City, N. J., a year ago, is expected.

The National Association of Road Machinery and Material Manufacturers is preparing a remarkable exhibit in connection with this convention which will be of more than general interest.

The American Banking Association and the American Bar Association will hold special meetings in Detroit at that time to discuss road improvements from the standpoint of finance, law and legislation, and endeavor to lay plans for a national meeting to codify state laws and recommend simple and uniform legislation.

Mills Resume

The Brooke Iron Co., Reading, Pa., whose rolling mill, sheet mill and nail factory departments have been idle for the past two months, resumed operations Monday morning, Sept. 15. During the suspension repairs were made to buildings and machinery. The new rate for puddling is $5 per ton.

R. W. Huston, vice president of the Capital Construction Co., Columbus, O., died suddenly at Cincinnati, Sept. 5, aged 53.

METAL MARKETS

New York

Sept. 23.

Copper.—The copper market has struck a quiet spot, demand having ceased temporarily as a result of declines in the price of standard copper, both in London and New York. Another factor in quieting the demand was the announcement on Tuesday of last week of an advance in the price of refined copper. Leading producers and selling agencies declared this advance necessary in order to save themselves from being entirely sold out of nearby positions. These interests report that they expect another buying movement to begin shortly which will result in most of the consumers covering their requirements over the balance of the year. Most leading sellers are now sold up through October and the best part of November. The two largest producers are the only ones having spot to offer. The producers' price is now 16.87½c to 17.00c, thirty days' delivery on electrolytic. Small quantities are being sold by second sellers at about 16.62½c cash New York. Prime lake is very scarce and is held at 17.50c, cash, but this price can be shaded. Casting is also very scarce, being held at 16.50c to 16.62½c, 30 days.

The standard market was stronger today. Today's London close was £74 2s 6d for spot standard and £73 17s 6d for three months. Today's settling price in New York for standard was 16.15c for September, October and November. Exports of copper so far this month, including today, amount to 25,131 tons.

Tin.—Demand for tin has fallen off temporarily and the price is inclined to be weak. Yesterday the metal sold at 41.75c, the price which was offered; if less had been offered the sale would probably have been made just the same. Today's close on the London exchange was £190 12s 6d for spot and £191 7s 6d for three months, a decline of nearly £4 during the past week. Deliveries into consumption continue good and it is estimated that deliveries during September will amount to about 3,500 tons. Arrivals so far this month amount to 3,069 tons, while 3,040 tons are afloat.

Spelter.—This metal has weakened and prime western brands, in carload lots, may now be had at 5.75c to 5.80c, New York.

Lead.—Demand for lead is dull. The leading interest continues to ask 4.75c for carload lots, New York delivery. The outside market has developed a slight weakness in tone. This is due to the fact that second sellers are accumulating large stocks, as a result of deliveries of metal which they contracted for some time ago when they thought that there was a probability of a shortage in lead. Some of these interests say they are willing to sell lead for 4.70c.

Antimony.—Demand for antimony is exceedingly dull and the market is stagnating. Cookson's is held at 8.30c to 8.40c; Hallett's at 7.87½c to 8c, and other brands at 7c to 7½c. The prices are nominal.

Chicago

Sept. 22.

New Metals.—The restricted production resulting from the strike in the Michigan copper country is now being keenly felt in the non-ferrous metal trade. Lake copper is scarce and quotations as high as 16½c, Chicago have been made. Spelter is a little easier and the tin market is also weakening in sympathy with declines in the east.

We quote dealers' selling prices, f. o. b. Chicago as follows:

Lake copper, carload lots, 16½c, casting, 16⅜; smaller lots, ¼c to ¾c higher. Spelter, car lots, 5.75c; lead, desilverized, 4.70c; sheet zinc, $8.00, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 42¾c; Cookson's antimony, 8½c; other grades, 7½c.

Old Metals.—The strong position of the new copper market has resulted in another advance in the various grades of old copper and brass. Lead, tin and zinc compositions on the other hand are easier. Consumers are not entering the market freely except for their immediate requirements.

We quote dealers' selling prices f. o. b. Chicago as follows:

Copper wire, crucible shapes, 14c; copper bottoms, 12¼c; heavy red brass, 13c; heavy yellow brass, 8½c; No. 1 red brass borings, 11¼c; No. 1 yellow brass borings, 7¾c; brass clippings, 10c; lead pipe, 4½c; zinc scrap, 4⅝c; tea lead, 4c; No. 1 aluminum, 17c; No. 1 pewter, 28c; block tin pipe, 36½c; tin foil, 32c; linotype dross, 3¼c; electrotype dross, 3¼c; stereotype plates, 4⅜c; stereotype dross, 3¼c.

PLAUSIBLE STORY

But Lacks Confirmation—Officials Refuse to Talk.

Rumors are again afloat in Philadelphia to the effect that negotiations are under way for the purchase of the controlling stock interest of the Pennsylvania railroad in the Cambria Steel Co. The reports declare that an offer has been made by two western steel companies for this stock, but that the price tendered has not been satisfactory to the Pennsylvania railroad. A second proposition of purchase, the report goes, has now appeared from a Pittsburgh syndicate. Both offers are said to be under consideration now, but nothing definite has resulted. In connection with these rumors, the stock of the Cambria Steel Co. on the Philadelphia exchange has shown a substantial price advance.

President Samuel Rae, of the Pennsylvania railroad, and others interested, have declined to make any definite statements about any negotiation that may be under way. While it is believed in well-informed circles that the Pennsylvania railroad would welcome an opportunity to dispose of its holdings at a satisfactory price, because of the disposition of the government to look with disfavor upon such stock relation of large companies, there is nothing to show that present overtures in this direction will result successfully. The outstanding stock of the Cambria Steel Co. is $45,000,000. The Pennsylvania Co., the western subsidiary of the Pennsylvania Railroad Co., owns $22,504,100 of the par value of this stock.

Bridges for Reading

New York, Sept. 24. (By wire.)—The American Bridge Co. has 800 tons for the bridges for Reading, at Olney, Pa. The report that the American company has closed 4,000 tons for the Ford Motor Co. building, Philadelphia, is incorrect. It is positively stated that the award is unsettled and that the steel plans are being re-designed.

Foundrymen Have Clambake

About 125 foundrymen and their friends took part in the clambake given by the New England Foundrymen's Association at Riverside Grove, on the Connecticut river, near Springfield, Mass., Sept. 17. The foundrymen assembled at the Hotel Worthy, in Springfield, and then boarded a special steamer for a trip down the river to the scene of the festivities. Following the enjoyment of a sumptuous shore dinner, the party again returned to the Hotel Worthy, where a vaudeville entertainment was given. A buffet lunch was served. Chas. L. Newcomb, of the Dean Steam Pump Co., Holyoke, Mass., presided. The arrangements for the clambake were in direct charge of a local committee of foundrymen.

SAFETY BUREAU

Provided in House Bill Approved by House Committee.

Washington, Sept. 23.—Endorsement of a bill drafted by Minority Leader Mann, of the house of representatives to create a Bureau of Labor Safety was readily given by the house committee on labor last week. The measure will be reported favorably at the winter session. Not only has it the support of the committee, but also that of Secretary Wilson, of the Bureau of Labor, which would have jurisdiction over the proposed new bureau. The Mann measure provides for the bureau to act as a federal clearing house to give advice on safety plans and devices of all kinds, and Secretary Wilson, in a communication to the committee, said that information would comprise that available in the states of this country as well as in foreign countries.

Mr. Mann's bill provides for a commissioner of labor safety at $4,500 per year, and the bureau would be empowered to investigate and examine labor safety plans and compile and publish information regarding the use of labor safety devices.

Bope Improves.—Col. H. P. Bope, vice president of the Carnegie Steel Co., who was operated upon for appendicitis at New York City, Sept. 16, is convalescing steadily in a private hospital and his condition is very favorable. It is expected he will return to Pittsburgh in a short time.

Temporary Shut Down.—The Upson Nut Co., Cleveland, shut down its steel plant this week, but will resume next week.

The Busch Sulzer Bros.-Diesel Engine Co. of St. Louis, advises that its plant is nearing completion. Work has already been started in the pattern shop and several tools in the machine shop are in operation. The wood block floor of the machine shop is now being laid and the finishing touches are being made on the erecting shop.

COAL CONSUMPTION

By Iron and Steel Makers Has Not Been Reduced.

Pittsburgh, Sept. 23.—Iron and steel manufacturers throughout the country have not reduced their consumption of bituminous coal, and some of the larger interests are using more fuel at present than at any time this year. Demand indicates that mills are being driven at about the same rate established early in the year.

The general coal market is quiet, and heaviest consumers have covered requirements until next February. Operators are stocking surplus tonnages, and very little spot fuel is being offered. Some shippers are asking $1.15 a ton for prompt, or 25 cents above the figure at which consumers covered this year's needs.

Nominal quotations are as follows: Slack, 90c; nut slack, $1.05; nut, $1.25; mine run, $1.30; ¾ inch, $1.40; 1¼ inch steam, $1.50; 1¼ inch domestic, $1.55 a ton at the mine in this district. Coal for spot shipment is commanding from 10c to 25c above the nominal market prices.

Lincoln Memorial Bids

Washington, Sept. 24. (By wire.)—The general contract for the Lincoln Memorial, to be built in Potomoc Park, Washington, may be let tomorrow at the meeting of the commission. Alternate steel bids for structural material have been put in by the Carnegie and Jones & Laughlin companies, among others, for 150 and 230 tons. It is optional with the commission as to the use of piling, but if steel sheet piling is decided upon, a greater tonnage will be required, steel to be bought direct from mill and fabricated here. Seventeen principal constructing firms entered bids for building the memorial, to cost not more than $2,000,000.

Will Soon Close for Rail Needs

New York, Sept. 24. (By wire.)—Next year's rail orders for two large systems are in final negotiation, and announcement of the distribution is expected shortly. The Lehigh Valley has placed 3,000 tons of rails additional with the Carnegie Steel Co., for October. The Pacific Great Eastern, of British Columbia, has bought 3,000 tons and the Peruvian Central 1,000 of the United States Steel Products Co.

Frank Samuel, of Philadelphia, has returned from an extended tour of the British Isles.

GOOD TONNAGES

Of Car Material Recently Booked, But Railroad Buying Light.

The lack of sizeable railroad buying of iron and steel products is being emphasized more and more by the declining position of the mills in the heavier lines of manufacture. It is believed this condition will be radically changed if the railroads obtain the 5 per cent advance in freight rates for which they are now petitioning, and the opinion gains ground that they will probably be successful in this movement.

The purchases of cars and locomotives, rails and structural work at present remain small. Of these products, there is probably more activity in structural work than any other, but even this is light, relatively. The Lehigh Valley continues to put out inquiries for terminal improvements at Buffalo.

There has been considerable quiet car buying in the west, and the leading interest has booked from 25,000 tons to 30,000 tons additional steel from western car builders recently. A similar tonnage was recently booked at Pittsburgh. The Burlington is in the market for some miscellaneous bridge material.

CAR AND LOCOMOTIVE ORDERS.

Philadelphia & Reading Railroad, 50 steel passenger coaches, placed with the Harlan & Hollingsworth Corporation. Will build 10 freight and 10 passenger locomotives in its own shops at Reading. This road has also ordered one sea-going barge from the Robert Palmer's Sons Ship Building & Marine Railway Co.

Division of recent passenger coach order of New York Central lines now announced, gives 100 passenger coaches to the Standard Car Co., 135 to the American Car & Foundry Co. and 55 coaches and 31 postal cars to the Pressed Steel Car Co.

The Western Railway of Minas in Brazil has placed an order for three consolidation locomotives with the American Locomotive Co.

The Nigerian Railways of Africa have ordered two superheater mountain type locomotives from the American Locomotive Co.

The Toledo Terminal Railway has placed two superheater consolidation freight locomotives with the American Locomotive Co.

The Chicago Junction Railway has ordered one superheater six-wheel switching locomotive from the American Locomotive Co.

The Great Northern has distributed orders for 133 passenger coaches and postal cars between the Pullman Co. and the Barney & Smith Car Co.

The American Car & Foundry Co. is rebuilding 1,800 freight cars for the Erie.

The Norfolk & Western has placed contracts for 24 electric locomotives with the Baldwin Locomotive Works and the Westinghouse Electric & Mfg. Co.

The Pennsylvania railway has ordered 100 locomotives from the Baldwin Locomotive Works.

The Pullman Co. and the Barney & Smith Car Co. will build 125 mail and passenger cars for the Great Northern.

CAR INQUIRIES.

The Chicago & Northwestern is negotiating for between 2,000 and 2,500 all steel gondolas.

The Northern Pacific is inquiring for 31 coaches and 16 mail cars in addition to 40 refrigerator cars and 12 baggage cars previously reported.

The Chicago & Illinois Midland is inquiring for two 100-ton freight locomotives.

DEVELOPS SLOWLY

Conservatism Prevails in Structural Material Market.

A good tonnage of work is reported by fabricators to be in a preparatory stage in the eastern district, but the obstacles imposed by tight money and general conservatism are blocking any considerable development of these plans. Lettings in the east continue light. Close fabricated quotations are being made on the larger work. In the Philadelphia district, about $40 a ton, delivered, was recently quoted on an important piece of work.

The Onadaga Hotel Co. has just received plans from Architects Esenwein & Johnson, Buffalo, for a 10-story addition to its hotel at Syracuse, taking about 1,000 tons. Plans will be completed Nov. 1 by Architects Green & Wicks, Buffalo, for the city's new South Side high school, taking about 1,400 tons.

Between 15,000 and 20,000 tons of bridge and structural material are involved in somewhat indefinite inquiries, according to estimates by fabricators in the Pittsburgh district. Some of the fabricating shops are in a position to assure rather quick delivery, and are actively soliciting additional tonnages.

Aside from the new shops of the Crane Co., Chicago, there are no large fabricating contracts pending in the west. The Crane contract will total about 3,000 tons. D. H. Burnham & Co. are the architects and the plans have been drawn for the employment of Bethlehem sections. The American Bridge Co., however, and some others are submitting alternate plans involving standard shapes. The volume of small contracts continues good and most of the western fabricators have at least 90 days' work ahead.

CONTRACTS PLACED.

Thickener and round table buildings, Anaconda Copper Co., Anaconda, Mont., 1,500 tons, the Jones & Laughlin Steel Co.

Building for Keasbey & Matteson Co., Ambler, Pa., 200 tons, the Jones & Laughlin Steel Co.

City of Philadelphia, various small bridges requiring 920 tons. Bids taken. F. J. Boas low on Temple street bridge, 650 tons; David Peoples and Steir-Marsh Construction Co., low on the others.

Lock Bridge No. 2, City of Baltimore, 1,000 tons, the McClintic-Marshall Construction Co.

Union Carbide Co.'s plant, Welland, Ont., 2,000 tons, Lackawanna Bridge Co.

Pacific Telephone & Telegraph Co., office building, Los Angeles, Cal., 400 tons to the Baker Iron Works.

Orpheum theater, Kansas City, Mo., 610 tons, to the American Bridge Co.

Apartment for the Almore Realty Co., Eighty-sixth street, New York City, 800 tons, awarded to the Hinkle Iron Works.

Royal Bank, Toronto, Canada, 2,900 tons, awarded to the Dominion Bridge Co.

Extension to the plant of the Otis Elevator Co., Harrison, N. J., 600 tons, understood to have gone to American Bridge Co.

City of Baltimore, highway bridge, 1,000 tons, awarded to McClintic-Marshall Construction Co.

Chicago & Eastern Illinois, 1,000 tons for bridges, Lackawanna Bridge Co.

STRUCTURAL CONTRACTS PENDING.

Pier No. 1 for Providence, R. I., 1,000 to 1,400 tons, depending on whether second story is included. Bids being taken this week by the state.

Office building, R. G. Dunn & Co., Brooklyn, about 500 tons. Bids going in this week.

Pier shed for Canton Co., Baltimore, 400 tons. Bids taken.

City hall, Huntington, W. Va., 650 tons. Bids go in Sept. 24.

Hotel, Columbus, Va., 250 tons. Bids go in this week.

Taylor store addition, Cleveland, 700 tons, bids to be received Sept. 25.

Repair shops, Cleveland Railway Co., 800 tons, bids to be received Sept. 25.

The New York Central has issued inquiries for another section of its terminal area, New York City, about 500 tons.

Activity in Steel Bars

New York, Sept. 24. (By wire.)—Steel bar mill products remain about the strongest on the finished list according to different leading makers. New buying at full prices is being done and railroads, despite their indifference in other lines, are reported to be closing bars freely. There is a heavy demand for reinforcing bars and a similar condition is reported in hoops.

Southern Pig Iron Strong

New York, Sept. 24. (By wire.)—The recent movement in southern iron, in the opinion of some leading makers, has been the best in several years. At present, southern furnaces are pretty well cleaned up on their offerings for this year and the market seems well established at $11.50 for last quarter and first half.

H. C. Pearce has been made purchasing agent of the Seaboard Air Line, succeeding H. C. Macklin.

Metal Schedule of the Senate Prevails

In Nearly All Its Provisions—Pig Iron, Ferro, and Semi-Finished Steel Placed on the Free List

Washington, Sept. 23.—Giving away on practically all the important items of the metal schedule, the house conferees on the tariff bill have granted a signal victory to the senate conferees.

With the prolonged discussion over ferro-manganese, pig iron and other disputed items settled in favor of the senate, it required but a short while to dispose of the other provisions of the schedule, aside from lead and zinc-bearing ores. They still remain unsettled, but an agreement on them is expected to be reached tomorrow along with other disputed points. The belief has been expressed that the bill will be ready for the signature of President Wilson not later than Saturday night, in which case the law would be effective Sunday and applicable to imports the following day.

The acquiescence on the part of the house conferees means the placing of pig iron, ferro-manganese, spiegeleisen, open-hearth and Bessemer slabs and blooms, ingots and billets on the free list. Ingots, blooms, slabs and castings, made by the crucible, electric or cementation process, are said to have been made dutiable at 12 per cent as proposed by the senate, a reduction from 15 per cent. A compromise as to structurals is reported to have been made. The house provision on this paragraph called for a duty of 12 per cent and the senate proposed 10 per cent. It is a question, however, whether the senate made any recession whatever on this paragraph.

It is not known whether the house conferees are insisting on the lower rates on lead and zinc-bearing ores or not. They have been in the position of contending for higher rates all along, these two items being among the few which carried lower rates in the house bill than were provided by the senate.

Because of the apparent ease with which the senate conferees gained their points as to the metal schedule, aside from the few sharply contested items, the belief exists that the house conferees used the metal schedule for trading purposes that they might gain numerous recessions granted them on other schedules. It appears to be true that more concessions were granted by the house on the metal schedule than any other in the entire bill.

The house and senate rates on the more important items of the metal schedule follow:

		Per lb.
Aluminum	25	2½c 3½c
Antimony ore	10	Free
Lead bearing ores	½c	¾c
Zinc bearing ores	10	12½
Zinc in sheets and pigs	10	15
Basket clause	25	20

	House rate. Per cent.	Senate rate.
Pig iron	8	Free
Ferro-manganese	15	Free
Muck bar, bar iron, etc.	8	5
Structurals	12	10
Boiler plate, etc.	15	12
Anchors, forgings, etc.	15	12
Tin plates, taggers tin, terne plates	20	15
Bessemer and open-hearth ingots, blooms, billets, etc.	10	Free
Bessemer and open-hearth bars, castings, etc.	10	8
Ingots, blooms, slabs, castings, crucible, electric or cementation process	15	12
Grit, shot	30	25
Steel wool	20	15
Round wire	20	15
Nuts	15	5
Spiral nutlocks and lock washers	35	25
Bolts	15	10
Card clothing	40	10 30
Cast iron pipe	12	Free

On the day that the conferees finally agreed to the senate's provision free-listing ferro-manganese, a visit to the president was made by Secretary of the Treasury McAdoo and Congressman Palmer, the latter having written and had charge of the metal schedule in the house ways and means committee and defending it in the house. Their visit gave rise to a report, apparently well founded, that they were urging the president to have the house duties in the metal schedule restored for the sake of revenue. The revenue feature is said to have been the only argument strongly urged in behalf of the metal schedule. Secretary McAdoo and Congressman Palmer are credited with having told the president that the big cuts made by the senate in the metal schedule, as well as in others, would create an alarming loss of revenue. If they did point out these things to President Wilson their contentions brought no result, because that day it was announced that the senate had been victorious in its position toward rates in the metal schedule, with here and there a probable and slight recession. It was definitely said, among other things, that ferro-manganese was free-listed, as were Bessemer and open-hearth ingots, etc.

Senator Simmons has reported that there will be plenty revenue, experts having advised him there would be a surplus of $16,000,000 during a normal year. Articles of the metal schedule which have been free-listed, based on the Payne-Aldrich rates, would raise a revenue of approximately $1,500,000, according to estimates. Figures are not available showing what loss of revenue from this schedule will follow because of the reduced duties, but it is placed at a big total. Calculators on this feature of a tariff bill differ in methods of arriving at a figure. The matter of increased importations under lower duties and the amount of the increase become a vexing question.

One house conferee estimated that a duty of 15 per cent on ferro-manganese would mean an annual revenue of $400,000. This is out of all proportion to the estimate made in the house bill, which was placed at only $82,500, as compared with $190,203 in 1912. Steel ingots, etc., of all kinds in 1912 raised a revenue of $538,342, and the house committee estimated the revenue under the proposed duty of 10 per cent would raise a revenue of $400,000. Round wire is also a big revenue raiser, receipts from duty on it in that year being $239,098, and the house committee made an estimate of $200,000. Aluminum last year raised a revenue of $1,074,990, and the house made an estimate under its proposed 25 per cent duty of $625,000. The senate applied specific rates to aluminum which it is said will raise about the same revenue as the estimate made by the house.

The Follansbee Brothers Co., Pittsburgh, with mills at Follansbee, W. Va., which is mentioned elsewhere in this issue as erecting a brick plant and opening a coal mine at Irondale, O., advises just before we go to press that the statement is incorrect, and that neither this company nor any of the Follansbees, as individuals, are interested in a plant of this kind or a coal mine at Irondale.

The Erie Malleable Iron Co., Erie, Pa., has its new offices and a large share of the enlarged plant, doubling the capacity, ready for occupancy. The additional shops cover a city square, 400 x 600 feet, and consent of the city authorities to use several feet of the street was found advisable when the machinery was put into operation, so as to enable the workers to get around more readily.

IRON AND STEEL PRICES

Pig Iron

PITTSBURGH

(Through This Year.)

Bessemer	$16.60
Basic	14.90 to 15.15
No. 2 foundry	14.90
Malleable	15.15 to 15.40
Gray forge	14.40

(The freight from valley points is 90c.)

CLEVELAND

(Through this Year Delivered in City.)

No. 1 foundry	$15.00 to 15.50
No. 2 foundry	14.75 to 15.00
No. 2 southern	15.10 to 15.35
Bessemer	16.65
Silveries 8 per cent silicon	18.55 to 19.05

CINCINNATI

(Third and Fourth Quarters.)

Southern foundry No. 1	$14.75 to 15.25
Southern foundry No. 2	14.25 to 14.75
Southern foundry No. 3	13.75 to 14.25
Southern foundry No. 4	13.50 to 14.00
Southern gray forge	13.25 to 13.75
Mottled	13.25 to 13.50
Southern No. 1 soft	14.75 to 15.25
Southern No. 2 soft	14.25 to 14.75
Standard southern car wheels	27.25 to 27.75
Southern Ohio No. 2	15.20
Southern Ohio No. 3	14.70
Southern Ohio No. 4	14.45
Silveries 8 per cent silicon	18.20 to 18.70

(Freight from Ironton, $1.20; from Birmingham, $3.25.)

CHICAGO

(Delivered Chicago, this year, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnace.)

Lake Superior char., No. 1 to 4	$15.00
Northern foundry No. 2	15.00
Southern foundry No. 2	15.35
Jackson co. silveries, 8 per cent	19.40
South'n silveries, 5 per cent sil.	17.35
Alabama basic	15.35
Malleable	15.00

PHILADELPHIA

(Prompt and third quarter shipment delivered to consumer's plants, in Philadelphia and vicinity, unless otherwise specified.)

Northern No. 1X foundry	$16.25 to 16.50
Northern No. 2X foundry	15.75 to 16.25
Northern No. 2 plain	15.50 to 15.75
Standard forge (Eastern Pa.)	15.00 to 15.25
Virginia No. 2X	15.80 to 16.05
Southern No. 2	15.00 to 15.50
Standard low phos., Phila.	23.00 to 23.50
Lebanon low phos., furnace	17.50 to 18.00
Malleable	16.25 to 16.50
Basic (Eastern and Central Pa.)	15.25 to 15.50

NEW YORK

(Prompt and third quarter delivery, prices based at Jersey City and tidewater.)

Northern No. 1X foundry	$16.50 to 16.75
Northern No. 2X foundry	16.00 to 16.50
Northern No. 2 plain	15.50 to 16.00
Virginia No. 2X	16.10 to 16.35
Southern No. 2	15.25 to 15.75
Malleable	15.75 to 16.00
Gray forge	14.75 to 15.00

ST. LOUIS

(Throughout This Year.)

Southern No. 1	$15.75
Southern No. 2	15.25
Southern No. 3	14.75
Southern No. 4	14.25

(Freight, Birmingham to St. Louis, $3.75.)

BIRMINGHAM

(For southern delivery.)

No. 1 foundry	$12.00 to 12.50
No. 2 foundry	11.50 to 12.00
No. 3 foundry	11.25 to 11.75
No. 4 foundry	11.00 to 11.50
Gray forge	11.00 to 11.50
Mottled	10.25
Standard basic	11.50
Off basic	11.00
Charcoal	25.00

BUFFALO

(Through this year, delivered in city).

No. 1 foundry	$14.50 to 15.00
No. 2X foundry	14.25 to 14.75
No. 2 plain	14.00 to 14.25
No. 3 foundry	14.00
Gray forge	13.75 to 14.00
Malleable	14.50 to 14.75
Basic	14.50 to 14.75
Charcoal	15.75 to 16.75
Charcoal (special brands)	17.00 to 20.00

Ferro Alloys

English and German 80 per cent ferro-manganese, prompt and forward delivery, $55 to $56 seaboard.

Fifty per cent ferro-silicon on contracts, $75, Pittsburgh, or Philadelphia, for carloads; $74 for larger lots and $73 for 600 tons or more. Twelve to 13 per cent, $24. Eleven to 12 per cent, $23. Ten to 11 per cent, $22. Nine to 10 per cent, $21 f. o. b. Globe, Jisco and Ashland furnace. Freight to Pittsburgh, $1.90.

Ferro-carbon titanium 8 cents per pound for carload lots; 10 cents per pound for 2,000-pound lots and over; 12½ cents per pound in lots up to 2,000 pounds.

Freight rates on ferro-manganese, foreign spiegeleisen and electrolytic ferro-silicon from Baltimore to Pittsburgh, $2.16; to Youngstown, $2.48; to Cleveland, $2.57; to Detroit and Columbus, $2.99; to Cincinnati, $3.40; to Chicago and Milwaukee, $4.00. Freights from Philadelphia and New York, 10 to 30 cents higher, respectively.

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
Denver	84½ cents
St. Louis	22½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, shapes and plates	80 cents

Coke

AT THE OVENS.

	Prompt shipment.	Contract.
Connellsville district:		
Foundry coke	$2.85 to 3.10	$3.00 to 3.25
Furnace coke	2.25 to 2.50	2.25 to 2.50
Wise county district:—		
Foundry coke	$2.75 to 3.50	$2.75 to 3.50
Furnace coke	2.25 to 3.25	2.35 to 3.25
Pocahontas district:—		
Foundry coke	$3.00	$3.00
Furnace coke	2.35 to 2.50	2.60 to 2.75
New River district:—		
Foundry coke	$3.25 to 3.50	$3.25 to 3.50
Furnace coke	2.60 to 2.75	2.60 to 2.90

Iron Ore

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, prices are: Old range Bessemer, $4.40; Mesabi Bessemer, $4.15; old range non-Bessemer, $3.60; Mesabi non-Bessemer, $3.40; all at lower lake ports.

Foreign iron ores, 7½ to 8 cents per unit, f. o. b. cars eastern seaboard. Freight rates from Philadelphia to eastern Pennsylvania furnace points range from 35 to 75 cents per ton.

Semi-Finished Material

PITTSBURGH

Bessemer 4 x 4 billets with 0.25 carbon and less, $25.00; open-hearth rolling billets, $25.00; Bessemer sheet bars, $25.50 to $26.00; open-hearth sheet bars, $25.50 to $26.00 f. o. b. Pittsburgh and Youngstown. Forging billets, $30, Pittsburgh. Wire rods, $27.50 to $28.00; muck bar, $31, Pittsburgh.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity; 4 x 4-inch open-hearth and Bessemer rolling billets at $25.50 to $26.50, and forging billets at from $31 to $32; muck bar, $28 to $30.

Standard Shapes

PITTSBURGH

Standard structural shapes, 1.40c to 1.45c. For extras see card of Sept. 1, 1909.

CHICAGO

Standard structural shapes, 15 inch and under, 1.58c to 1.63c.

PHILADELPHIA

Delivered to consumers in Pittsburgh and vicinity. Standard structural shapes from eastern Pennsylvania mills, 1.55c to 1.60c. From Pittsburgh mills, 1.60c.

NEW YORK

Standard structural shapes delivered at New York by eastern Pennsylvania makers 1.56c to 1.61c. On forward delivery, Pittsburgh district makers are quoting 1.61c, New York.

Plates

PITTSBURGH

Standard steel plates ¼ inch thick, 6¾ to 100 inches, 1.40c to 1.45c. For extras, see card of Sept. 1, 1909.

CHICAGO

Tank plates, 1¼ inches thick, 6⅝ to 100 inches wide, 1.58c to 1.63c.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: Tank plates from eastern Pennsylvania mills for prompt or forward delivery 1.55c to 1.60c. The larger Pittsburgh makers quote 1.60c, but smaller mills in that district are doing 1.55c.

NEW YORK

Steel plates, tank quality, for prompt and forward delivery at New York by eastern Pennsylvania makers, 1.56c to 1.61c. Pitts-

burgh makers are quoting 1.56c to 1.61c, New York.

Sheets and Tin Plate

PITTSBURGH

No. 28 black	2.10c to 2.20c
No. 30 tin mill black	2.10c to 2.20c
No. 28 galvanized	3.10c to 3.20c
No. 10 blue annealed	1.60c to 1.65c
No. 28 painted, corrugated	2.20c to 2.30c
No. 28 galvanized, corrugated	3.20c to 3.30c
Tin plate, 100-pound cokes	3.50c to 3.60c

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: No. 10 gage annealed sheets at 1.80c.

Pipe and Boiler Tubes

PITTSBURGH

	Black Butt.	Galv. Weld.
Steel, ¾ to 3 inches	80	71½
Iron, ¾ to 2½ inches	72	61
BOILER TUBES		
Steel, 3½ to 4½ inches	69	..
Iron, 3½ to 4½ inches	58	..

Other sizes of pipe and tubes take the usual advances as per official cards.

Rails and Track Material

PITTSBURGH

Steel rails, 50-pound and heavier, 1.25c per pound for Bessemer and 1.35c for open-hearth, carload olts; less than 500 tons 1.35c per pound; light rails on base weight of 40 to 45 pounds, 1.25c, schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c, base, Pittsburgh; track bolts, 2.40c base, Pittsburgh.

Railroad spikes, 4½, 5 and 5½ and 9-16 inch, 1.65c.

CHICAGO

Light rails, carloads, 25 to 45-pound, 1.25c, base; 16 to 20-pound, 1.30c; 12-pound, 1.35c; 8-pound, 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $22 and $23; standard section relaying rails, subject to inspection, $23 to $24.

Track fastenings, f. o. b. Joliet:

Angle bars, 1.50c; railroad spikes, 1.70c; smaller size spikes, 1.85c base; track bolts with square nuts, 2.20c to 2.25c.

Bars, Hoops and Bands

PITTSBURGH

Common iron bars, 1.55c to 1.60c, Pittsburgh; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator, 1.40c; channels, angles, zees, tees, under 3 inch, 1.50c, all f. o. b. mill.

Hoops in carload lots, 1.60c, Pittsburgh; in less than carload lots, 1.65c; bands, 1.40c, base, with net extras, as per standard steel.

Cold rolled and ground shafting, 60 to 62 per cent off in carloads and 55 to 57 per cent in less than carloads delivered in base territory.

CHICAGO

Bar iron, 1.35c to 1.40c, hard steel bars rerolled, 1.50c; soft steel bars, bands and small shapes, 1.58c; hoops, 1.63c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting, 58 per cent off list for carload lots, 53 per cent off for less than carloads.

PHILADELPHIA

Delivered in consumers' plants in Philadelphia and vicinity: Steel bars, 1.55c to 1.60c on contract and common bar iron, 1.32½c to 1.42½c. Cut nails 1.90c to 1.95c, Philadelphia. Shafting 62 and 60 off in carloads and 57 and 55 off in less than carloads in base territory.

NEW YORK

Delivered in New York steel bars on contract from 1.56c to 1.61c, and common iron bars, 1.33c to 1.45c.

Bolts, Nuts and Rivets

Rivets

Button head structural rivets, 2.00c, Pittsburgh, cone head boiler rivets, 2.10c. Small rivets, 75, 10 and 10 off.

Structural rivets, Chicago, 2.00c; boiler rivets, 0.10c extra.

Bolt and Nut Discounts

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, small and shorter, rolled threads, 75 and 10; cut threads, 75 and 5; larger and longer, 70 and 2½.

Machine bolts with hot pressed nuts, ⅜ x 4 inches, smaller and shorter, rolled 75, 10 and 5; cut, 75 and 10; larger and longer, 70 and 7½.

Gimlet and cone point lag or coach screws, 80 and 10.

Hot pressed square, blank or tapped nuts, $5.70 off list; hot pressed hexagon blank or tapped, $6.30.

Cold pressed C. & T. square, blank or tapped, $5.70 off; hexagon, blank or tapped, ⅜-inch and larger, $6.60 off; ⅛-inch and smaller, $7.20 off.

Wire Products

PITTSBURGH

Wire nails, jobbers' carload lots, $1.65; retailers' carload lots, $1.70; cut nails (western makers), jobbers' lot, $1.65; painted barb wire, jobbers' carload lots, $1.65; retailers' carload lots, $1.70; plain wire to jobbers in carloads, $1.45; and to dealers in carloads, $1.50; polished staples, $1.65; galvanized staples, $2.05.

CHICAGO

Wire nails, jobbers' carload lots, $1.83; retailers' carload lots, $1.88; retailers' less than carload lots, $1.93; painted barb wire, jobbers' carload lots, $1.83; retailers' carload lots, $1.88; retailers' less than carload lots, $1.93; with 40c for galvanizing; plain wire, jobbers' carload lots, $1.63; retailers' carload lots, $1.68.

Cast Iron Pipe

CHICAGO

Four-inch water pipe, $27; ½ to 12 inches, $26; larger sizes, $24; gas pipe, $1 a ton higher.

NEW YORK

Six-inch pipe, 30 pounds to the foot, $23 to $25, f. o. b. New York, in carload lots.

BIRMINGHAM

Water mains: 4-inch, $22.00; 6 to 8-inch, $20.50; larger sizes, $20. Gas main: $1 per ton higher than water main. Special fittings, $47.50 to $52.50.

Old Material

PITTSBURGH

(Gross Tons Delivered.)

Heavy melting scrap	$12.50 to 12.75
Rerolling rails	14.00 to 14.50
Malleable	12.00 to 12.25
Bundled sheet scrap	8.00 to 8.25
Iron axles	24.00 to 24.50
Old iron rails	14.50 to 15.00
Stove plate	9.00 to 9.25
No. 1 wrought scrap	13.00 to 13.50
Old car wheels	12.50 to 13.00
Low phosphorus	15.00 to 15.50
Machine shop turnings	7.00 to 7.25
No. 1 busheling	11.00 to 11.50
Cast borings	8.25 to 8.50
No. 1 cast scrap	12.25 to 12.75

PHILADELPHIA

Gross tons delivered to consumers' plants in eastern Pennsylvania and western New Jersey:

Old iron rails (nominal)	$17.00 to 17.50
Old steel rails (rerolling)	15.00 to 15.50
No. 1 heavy melting steel	11.50 to 12.00
Old car wheels	12.50 to 13.00
Old iron axles	25.00 to 26.00
Old steel axles	17.50 to 18.00
No. 1 railroad wrought	14.50 to 15.00
Wrought pipe	11.25 to 11.75
Cast borings	8.25 to 8.50
Machine shop turnings	8.00 to 8.50
Heavy cast (broken)	13.00 to 13.50
Malleable	11.50 to 12.00
Stove plate	10.00 to 10.50
No. 1 forge	10.00 to 10.50
Low phosphorus	15.00 to 15.50

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg, and Steelton, Pa.; $1.40 to Milton, Pa.

CLEVELAND

Gross Tons

Old iron rails	$15.00
Old steel rails (under 3 ft.)	13.00 to 13.50
Old steel rails (over 6 ft.)	13.50 to 14.00
Relaying rails	23.00 to 25.00
Old steel boiler plate	9.00 to 9.50
Malleable iron (railroad)	11.75 to 12.00
Axle turnings	7.50 to 8.00
Steel axles	18.00 to 19.00
Malleable iron (agricultural)	9.00 to 9.50
Heavy steel	10.50 to 11.00
Country mixed steel	8.50 to 9.00
Bundled sheet scrap	7.00 to 7.50

Net Tons

No. 1 R. R. wrought	$11.00 to 11.50
No. 1 busheling	9.00 to 9.50
No. 1 machine cast	11.00 to 11.50
No. 1 dealers' wrought	8.50 to 9.00
Machine shop turnings	4.00 to 4.50
Pipes and flues	7.50 to 8.00
Wrought drillings	4.00 to 4.50
Cast borings	5.75 to 6.00
Stove plate	8.25 to 8.50
Wrought iron arch bars	16.00
Wrought iron piling plate	14.00

CHICAGO

(Delivered in consumers' yards.)

Gross Tons

Old car wheels	$13.00 to 13.50
Old iron rails	13.75 to 14.25
Rerolling rails (5 ft. and over)	12.00 to 12.50
Old steel rails (3 ft. and und.)	11.25 to 11.75
Frogs, switches and guards	10.50 to 11.00
Heavy melting steel	10.50 to 11.00
Shoveling steel	10.00 to 10.50

Net Tons

No. 1 R. R. wrought	$9.75 to 10.25
No. 2 R. R. wrought	9.00 to 9.50
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers and springs	10.75 to 11.25
Shafting	14.50 to 15.00
Iron car axles	20.25 to 20.75
Steel car axles	15.75 to 16.25
Locomotive tires	12.00 to 12.50
Dealers' forge	8.50 to 9.00
Pipe and flues	7.50 to 8.00
No. 1 cast	10.75 to 11.25
No. 1 busheling	8.50 to 9.00
No. 2 busheling	6.50 to 7.00
No. 1 boiler cut	8.25 to 8.75
Boiler punchings	12.00 to 12.50
Cast and mixed borings	5.25 to 5.75
Machine shop turnings	4.75 to 5.00
Railroad malleable	10.75 to 11.25
Agricultural malleable	10.00 to 10.50
Angle bars, splices, etc., iron	13.00 to 13.50
Angle bars, steel	9.75 to 10.25
Stove plate and light cast scrap	8.75 to 9.25

NEW YORK

Gross tons, New York dealers' prices at tidewater, usually for eastern Pennsylvania delivery:

Old car wheels (nominal)	$10.50 to 11.00
Heavy steel axles	15.25 to 15.50
Steel shafting	13.50 to 14.00
No. 1 heavy melting steel	9.50 to 9.70
No. 1 R. R. wrought	12.00 to 12.25
Wrought pipe (not galvanized)	9.00 to 9.25
Cast borings	6.00 to 6.25
Machine shop turnings	5.50 to 6.00
Heavy cast	11.00 to 11.25

Stove plate	7.50 to 8.00
Grate bars	6.25 to 6.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City, and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City, and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City, and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City, and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark, $1.10 from New York.

CINCINNATI

Gross Tons

Old iron rails	$11.50 to 12.00
Old steel re-rolling	10.00 to 10.50
Old iron axles	16.00 to 16.50
Heavy melting scrap	9.00 to 9.50
Relaying rails	18.75 to 19.25

Net Tons

Old No. 1 R. R. wrought	$9.00 to 9.50
Bundled sheet scrap	5.00 to 5.50
No. 1 yard wrought	6.75 to 7.25
No. 1 machine cast	9.50 to 10.00
No. 1 busheling	7.00 to 7.50
Stove plate	6.75 to 7.25
Machine shop turnings	5.00 to 5.50
Cast borings	4.50 to 5.25
Heavy turnings	5.25 to 5.75
Mixed cast	7.75 to 8.25
Breakage	5.50 to 6.50
Malleable	7.00 to 7.50

BIRMINGHAM

Old iron axles (light)	$15.00 to 15.50
Old steel axles (light)	15.00 to 15.50
Old iron rails	12.50 to 13.50
No. 1 R. R. wrought	12.00 to 12.50
No. 2 R. R. wrought	10.00 to 10.50
No. 1 country wrought	9.50 to 10.00
No. 2 country wrought	8.50 to 9.00
No. 1 machinery cast	10.00 to 10.50
No. 1 steel scrap	10.50 to 11.00
Standard car wheels	12.00 to 12.50
Tram car wheels	10.50 to 11.00
Light cast and stove plate	8.25 to 8.75

BUFFALO

Gross Tons

Heavy melting steel	$10.50 to 11.00
No. 1 R. R. wrought scrap	13.00 to 13.50
No. 1 R. R. and mch. cast scrap	13.00 to 13.50
Old steel axles	17.00 to 17.50
Old iron axles	22.50 to 23.00
Car wheels	12.50 to 13.00
Railroad malleable scrap	12.00 to 12.50
Machine turnings	6.00 to 6.50
Heavy axle turnings	8.00 to 8.75
Cast iron borings	6.25 to 6.75
Low phos. steel scrap	16.50 to 17.00
Old iron rails	15.00 to 15.50
Boiler plate, sheared	12.50 to 13.25
Bundled sheet scrap	8.00 to 8.50
Stove plate (net ton)	9.75 to 10.00
Locomotive grate bars	10.00 to 10.50
No. 1 busheling scrap	10.50 to 11.00
No. 2 busheling scrap	8.00 to 8.50
Wrought pipe	9.50 to 10.00

ST. LOUIS

(Dealers' buying prices.)

Gross Tons

Old car wheels	$11.25 to 11.75
Old iron rails	12.00 to 12.50
Re-rolling rails (5 ft. and over)	11.00 to 11.50
Old steel rails (3 ft. and und.)	10.00 to 10.50
Light sec. relayers (45 pounds and und.) subject to inspec.	24.00 to 24.50
Relaying rails, subject to inspec.	24.00 to 24.50
Frogs, switches and guards	9.50 to 10.00
No. 1 R. R. heavy melting steel	9.50 to 10.00
Shoveling steel	9.00 to 9.50

Net Tons

No. 1 railroad wrought	$10.50 to 11.00
No. 2 railroad wrought	10.00 to 10.50
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers, springs	9.50 to 10.00
Shafting	13.50 to 14.00
Steel car axles	15.00 to 15.50
Iron car axles	19.25 to 19.75
Locomotive tires	11.00 to 11.50
Pipe and flues	7.50 to 8.00
Tank iron and cut boilers	7.25 to 7.75
No. 1 cut busheling	9.00 to 9.50
Cast iron borings	4.50 to 5.00
Machine shop turnings	5.50 to 6.00
Railroad malleable	8.50 to 9.00
Agricultural, malleable	7.00 to 7.50
Stove plates	8.00 to 8.50
Angle splice bars (iron)	11.00 to 11.50
Angle splice bars (steel)	9.00 to 9.50

Store Prices

CINCINNATI

Steel bars, 1.95c to 2c; iron bars, 1.85c to 1.90c; plates and shapes, 2.05c to 2.10c; sheets, blue annealed No. 10, 2.15c to 2.20c, black, No. 28, 2.65c; galvanized, No. 28, 3.75c; cold rolled shafting, round, square, hexagon and flat, 53c off.

CLEVELAND

Steel bars, 2.00c; plates and shapes, 2.10c; iron bars, 2.00c; sheets, No. 16 blue annealed, 2.40c; No. 28 black, 2.85c; No. 28 galvanized, 3.95c.

CHICAGO

Steel bars, 1.85c; iron bars, 1.85c; hoops, 2.50c; shapes and plates, 1.95c; No. 10 blue annealed sheets, 2.15c, black, No. 28, 2.80c; galvanized, No. 28, 4.00c.

PHILADELPHIA

Steel bars, 2.00c to 2.05c; structural shapes, 2.00c to 2.10c; plates, 2.00c to 2.10c.

NEW YORK

Steel bars, 2.05c; structural shapes, 2.15c; plates, 2.15c.

Electrical Engineers Meet

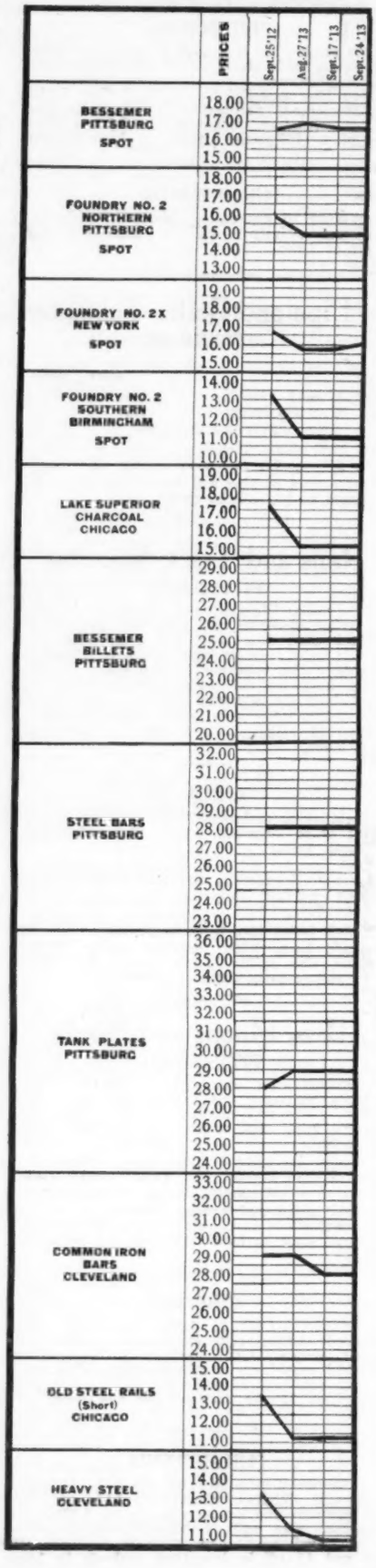
The Association of Iron and Steel Electrical Engineers is holding its seventh annual convention this week, at New York. About 200 of the leading engineers of the country are in attendance. On Sept. 26, the standardization committee will discuss general specifications for electric cranes, power transformers, automatic control, alternating current direct-connected generators, large alternating current motors for roll drives, and motor generators. The following officers were elected: President, E. Friedlaender, Braddock, Pa.; first vice president, O. R. Jones, Youngstown, O.; second vice president, R. Techentscher, South Chicago, Ill.; treasurer, James Farrington, Steubenville, O.; secretary, W. T. Snyder, McKeesport, Pa.

Sheet Prices Very Low

Pittsburgh, Sept. 24. (By wire.)—Continued irregularities feature the market for sheets. Frequent reports are being heard that black sheets are offered at 2.05c for base gage and it is not improbable that fairly heavy tonnages have been sold at that figure. Mills in need of additional tonnages appear willing to offer attractive prices for prompt delivery.

Christopher H. Starke, late president of the Milwaukee Bridge Co. and founder of the C. H. Starke Dredge & Dock Co., Milwaukee, left an estate valued at $100,000, according to the will just filed. The entire estate is bequeathed in five equal shares to four daughters and a number of grandchildren.

PRICE CHART



OBITUARIES

Jabez Burton Stubbs, long connected with the Struthers Furnace Co., Cleveland, and its predecessors, died suddenly from heart disease, in Cleveland, Sept. 19. Mr. Stubbs was born in Poland, O., Nov. 17, 1841, and was a telegraph operator for a number of years. He went to Chicago in the seventies and in time was elected secretary of the North Chicago Rolling Mill Co., where W. C. Runyon was employed as an office boy. The two became acquainted and the result was a friendship, which lasted through life. They formed the firm of Stubbs & Runyon, dealers in pig iron and coke, in Chicago, but after two or three years, the firm was dissolved and Mr. Stubbs engaged in the coal business. In 1884, Mr. Stubbs, Mr. Runyon and W. E. Mack formed the firm of Runyon, Stubbs & Mack, in Cleveland, and carried on the business of ore agents for five years, after which Mr. Stubbs withdrew. Two or three years later, Mr. Mack withdrew, and W. C. Runyon carried on the firm for a year. He then leased the Sharon Furnace, Sharon, Pa., and ran it as W. C. Runyon, Lessee, for two or three years. Mr. Stubbs came to Cleveland in 1895 and the firm of Runyon, Stubbs & Co. was organized. In 1896, it was succeeded by the Struthers Furnace Co., which bought the Brown-Bonnell furnace at Struthers, O. Mr. Stubbs became vice president and treasurer and continued as vice president until his retirement in 1907. After a short term as treasurer, he resigned that position, which was filled by his son, W. C. Stubbs, who died a number of years ago.

Although Mr. Stubbs had not been actively engaged in business for six years, he retained his interest in the Struthers Furnace Co. In recent years, he spent a great deal of his time in traveling and usually sojourned in California during the winter.

Edward Smith, of the Smith Gallison Co., Boston, died recently at a hospital in that city at the age of 61 years.

Nathan P. Stevens, an inventor of several improvements in locomotive construction, died at Concord, N. H., recently, aged 77 years.

H. Emmott Redman, secretary of the Mitchell-Lewis Motor Co., Racine, Wis., died Sept. 10 due to a stroke of paralysis, which he suffered on Aug. 30. Mr. Redman was 58 years old. He was born in Louisville, Ky.

William W. Fisher, organizer of the Bellefontaine Foundry & Machine Co., died at his home in Columbus, O., recently, aged 71. Mr. Fisher was, at one time, president of the United Telephone Co., vice president of the Commercial & Savings Bank and general manager of the Marion Steam Shovel Co.

Newland T. Depauw, president of the New Albany Mfg. Co., New Albany, Ind., died suddenly at his home at Haymarket, Va., last week, following an attack of apoplexy. Mr. Depauw was 58 years of age and a native of Salem, Ind. He had been interested in many industries, besides the machinery concern noted.

Robert Christman Neal, a member of a noted Pennsylvania iron family, died at his country home, Kinkora, near Duncannon, Pa., Sept. 21, aged 66. He was born at Bloomsburg and after graduating at Troy in 1867, joined the firm of William Neal & Sons, operating a furnace and other

J. B. STUBBS

iron enterprises. He came to Harrisburg in 1889 and formed the Harrisburg Rolling Mill Co., operating the old Lochiel Iron Works there until a few years ago, when they were sold and dismantled. Mr. Neal was president and general manager. He was also the dominating spirit in the Tyrone Iron Co., operating Tyrone Forges, and in the Eleanor Iron Co., at Holidaysburg. He had resided for some time at his country home on the site of the old Cove Forge, in Perry county.

Foundrymen and other manufacturers, at Erie Pa., report a daily increase in business. Due to the satisfactory conditions, the bank clearings of that city have shown weekly advance of from $150,000 to $200,000 over the corresponding weeks of last year.

GREAT INFLUENCE

Of Trade Papers Discussed at Federation of Press Associations.

One of the most interesting features of the eighth annual convention of the Federation of Trade Press Associations in the United States, held at the Hotel Astor, Sept. 18, 19 and 20, was an editorial symposium conducted by the editors of some of the country's leading class publications. In the treatment of subjects exclusively from an editorial standpoint by prominent editors and publicity men of large business corporations, the session was possessed of unusual character and so much interest was attracted by it that similar symposiums will be made a prominent feature of future conventions. A. I. Findley, editor of *The Iron Age,* led the discussion and in his introductory remarks, spoke of the advance in trade papers made within the past decade and the powerful influence now waged by such publications in various lines of business. Mr. Findley referred to the functions of the trade paper as a disseminator of the most valuable information in any trade, of its commanding position as a leader in correcting trade abuses through editorial suggestion, and in giving the public the most intimate expression from any particular industry. He called attention to the decentralizing agency of the trade press in these days of centralization of capital through furnishing information to the smaller business men in any industry.

Sessions were also held devoted to circulation, advertising and general business topics. Prominent publishers, advertising managers, advertisers and subscribers to trade publications, spoke upon such topics. The annual banquet of the Federation was held at the Hotel Astor, Friday evening, and John Clyde Oswald, of *The American Printer,* served as toastmaster. On Thursday noon, the visiting publishers were the guests at a luncheon at the Thirty-ninth Street Publishers' building, which was followed by an inspection of the plant and publishing offices of the Federal Printing Co.

Would Require Steel Cars

Washington, Sept. 23.—Congressman Allen, of Ohio, has introduced in the house a bill requiring interstate railroads to operate cars constructed of steel. Details of this bill were outlined recently in THE IRON TRADE REVIEW. The measure, among other things, provides for the retirement of 20 per cent of the wooden rolling stock each year for five years.

THE IRON TRADE REVIEW

DEVOTED TO THE IRON, STEEL, MACHINERY AND FOUNDRY INDUSTRIES

Published Every Thursday by

The Penton Publishing Company

CLEVELAND

BOSTON	201 Devonshire Street
CHICAGO	1521-23 Lytton Bldg.
CINCINNATI	513 Mercantile Library Bldg.
NEW YORK	503-04 West St. Bldg.
PHILADELPHIA	611 Bulletin Bldg.
PITTSBURGH	2148-49 Oliver Bldg.
WASHINGTON, D. C.	501 Metropolitan Bank Bldg.
BIRMINGHAM, ENG.	Princes Chambers

Copies published three months or more previous to date of current issue, 25 cents each.

All communications relating to changes of advertising copy, discontinuances, etc., must be received ten days prior to the next publishing date.

Subscription, United States and Mexico $4 per year.
Canada $6 and other Foreign Countries $8 a year.

Entered at the Postoffice at Cleveland as Second Class Matter.

Copyright 1913, by the Penton Publishing Co.

Cleveland, September 25, 1913

The Irreducible Minimum of Steel

Just now there is a great deal of discussion about the "irreducible minimum" of business in the country. Many men are asking the question whether commercial affairs generally have reached final position under policies of conservatism and retrenchment from which any material change must necessarily be towards an enlarged volume. There are some signs to show that the constant vigilance against over-extension of credit which has marked the banking situation since the panic of 1907 has produced a condition of sound minimum business based upon actual necessities.

Some of these manifestations of strength are now to be seen in the steel industry, which is comfortably engaged in spite of little support from its largest single patron, the railroads. A review of the moderate buying of bridges, an almost lifeless demand for new cars, a meager purchasing of rails and other iron and steel supplies, clearly shows a current purchasing power by the nation's steam transportation interests which is governed wholly by present needs and not by future provision. What is true of the railroads seems equally applicable to other large iron and steel buyers, who have practiced caution with some variations in recent years.

When the leading steel maker booked in August in new business between 70 and 75 per cent of its full capacity, it made a surprising showing under present conditions. Omitting the export tonnage, its new domestic business was about 60 per cent. The railroad buying represented in the total was practically inconsequential. Orders, on the whole, were markedly miscellaneous in their character. In 1907, 60 per cent of the total domestic business of the Steel Corporation was about 5,700,000 tons of finished products annually. Today, based on 1912 figures, it would be about 7,600,000 tons.

The natural expansion in steel demand for an increasing population has come forward steadily in the past five years. Added to this, there have been many and varied new uses of steel, which today have become practical necessities. How much of a part these new uses are playing in the present demand, does not admit of accurate estimate, but it has been considerable, and it is constantly enlarging.

The time was when the railroads held the balance of power where the prosperity of the steel industry was concerned. In a considerable measure, they still stand in this relation today. The genius of steel makers in providing new forms of use and the necessities of a discriminating public are bringing closer the day, however, when without sharp railroad support, the steel business may be said to be approximating its irreducible minimum.

The Advance in Southern Pig Iron

Rarely has there been so great a divergence in the conduct of the northern and southern pig iron markets as has occurred lately. From its low point southern pig iron has lately advanced from $1 to $1.50 per ton, while northern iron has advanced scarcely at all. The low point in southern iron was reached late in June, when there were large transactions at approximately $10, Birmingham, while the market today is firmly established at $11 as a minimum and with many furnaces quoting $11.25 to $11.50 for delivery during the first quarter and first half of next year.

In northern iron, the low point seems to have been reached somewhat later, towards the close of July. Since then, the trend in all northern markets has been distinctly upwards, but the actual movement of prices has been very slow.

As southern iron is competitive with northern over a wide belt of territory, a fair consonance in the movement should be expected, and history has shown that the parallelism really does occur, the distinctive feature being simply that northern iron usually makes its turns later than southern iron; in other words, southern iron has almost invariably been the leader, whether in advances or declines, but northern has always followed. For the present lack of harmony, there must be a reason.

Competitive conditions in the north and south seem to furnish one reason. There have been opposite trends. For a series of years in the north, there has been a tendency for steel works to build blast furnaces of their own, thus withdrawing their support from the merchant market, and leaving more pig iron to be disposed of by the merchant furnaces to foundries and other consumers apart from the large steel works. In the south, on the other hand, the tendency has

been to build steel works and withdraw pig iron from the merchant market.

Labor conditions may furnish another reason for the greater resilience in southern iron. While labor has been scarce everywhere, the southern furnaces are much more dependent upon labor than northern furnaces. There is more labor involved in the ore and coke, and it requires more men at the blast furnace in proportion to tonnage output. At the low point, there was more pressure for furnaces to go out of blast in the south than in the north.

There is an argument on the other side, which should not be overlooked, and that is that Connellsville coke, the chief fuel for northern furnaces, has been at relatively high prices, both in relation to its past prices and in relation to pig iron, from which one would rather expect northern iron to command unusually high prices in comparison with southern iron.

Sight must not be lost of the fact that the southern iron advance is recent, and that in such movements there has usually been an interval of time before northern iron has undergone the change experienced by southern. A few months hence, it may be found that the divergence between the movements of northern and southern iron has been merely in time, and not in the amount of advance.

Welfare Work, Voluntary and by Law

Our attention is called to a convention to be held at Harrisburg, Pa., late next month, under the auspices of the Engineers' Society of Pennsylvania. This convention is named in full the Pennsylvania Industrial Welfare Efficiency Convention, and is called "for the specific purpose of determining in what manner the industries of the state can co-operate with the department of labor and industry and other state departments, for the purpose of improving the economy of production and the quality of products. Recognizedly, one of the important methods of doing this is by improving the skill and physical capacity of the workers themselves, and reducing factors which cause irregularity in their times of employment."

The second day of this convention is to be "devoted more specifically to labor conditions and their improvement, from the standpoint of both employer and employe."

Evidently, a study of welfare work among the employes of industrial concerns is going to receive well merited attention from others than philanthropists.

The United States department of labor, bureau of labor statistics, recently conducted an investigation of employers' welfare work being promoted by a number of concerns. These were grouped under three heads, manufacturing establishments, mercantile establishments and public utilities. Included in the investigation are the Cleveland Twist Drill Co., the Cleveland Hardware Co., the Brown & Sharpe Mfg. Co., the Walker & Pratt Mfg. Co., the United Shoe Mfg. Co., the International Harvester Co., the Westinghouse Electric & Mfg. Co., the General Electric Co. and the Western Electric Co.

In discussing the results of this study, the investigator states that there is "a tendency in labor circles to condemn employers' welfare work. It is claimed that much of it is tinctured with paternalism and fosters a spirit of dependence on the good will of the employer incompatible with the aims of labor, and as a result the workers never reach their full development. The demand is for rights, not charity; that workers be paid enough and then left to order their lives as they see fit. It is rather taken for granted that welfare work is done at the expense of wages; that if the employer were without this particular fad the sum expended on it would be added to wages. This view is based on an assumption impossible of proof, but *a priori* argument is, of course, against it, as welfare establishments paying a lower wage would be unable to compete in the labor market with the ordinary establishment doing no welfare work. An eminent French authority has recorded of France that it has never been shown that the average wages in welfare establishments are lower than in others, nor does the little evidence in this country prove it. In the cotton industry in the south, the presence or absence of welfare work bears no relation to wages. A further objection to welfare work is that it is begun and maintained to prevent strikes and labor organizations. Obviously from the quid pro quo relation of employer and employe, this position is well taken, particularly when one considers the employer's prompt declaration of his motive in instituting welfare work; that it is good business policy and results in a better labor force. It has been said that the employes in the McCormick plant of the International Harvester Co. refrained from a sympathetic strike when the operatives of the Deering Works in the same corporation struck, because of the extensive welfare work in the former plant. To cite French experience again, the verdict there is that establishments with welfare work have been less exposed to labor troubles than those without."

After giving the results of investigations of numerous plants, the government investigator expresses the opinion that the time is not far distant when much of the present welfare work will be required by law. Undoubtedly, this is true. Some of it is already required by law. While provisions for cleanliness, pure drinking water, toilet rooms and ventilation may be so required, there are many other features of welfare work which may well be left to individual initiative and execution. Some employers will always be in advance of others, and among those who are most progressive, as is shown every month by the *Bulletin* of the American Iron and Steel Association, are leading manufacturers of iron and steel. It is true, however, as Mr. Topping has recently pointed out, that in order to secure the best results, the hearty co-operation of the employes must be obtained. That can never be done by law, but must be done by cultivating the spirit of cheerful co-operation. Real progress along this line is being made in some of the best plants of the country.

IRON MINING NEWS

New Record for Mesabi

It is expected that the Mesabi range will ship out more ore this year than ever before in its history. A careful estimate has been made by W. W. J. Croze, mining engineer, Duluth, of the expected output of each mine, and the total foots up to 37,134,000 tons. This is more than twice as much ore as the range shipped in the first eight years of its existence. Mr. Croze's figures were compiled for the Data Book, distributed at the recent Mesabi range convention of the Lake Superior Mining Institute. In detail the estimated shipments are as follows:

OLIVER IRON MINING CO.

Adams	932,000
Burt-Pool-Day	695,000
Canisteo	1,100,000
Chisholm	600,000
Clark	450,000
Dale	560,000
Fay	260,000
Fayal	1,271,000
Genoa-Sparta	1,020,000
Gilbert	185,000
Graham	100,000
Harold	245,000
Hill	810,000
Holman	775,000
Hull-Rust	3,742,000
Judd	100,000
Leonard	1,525,000
Leonidas	555,000
Mace	150,000
Missabe Mountain	325,000
Mississippi	275,000
Monroe-Tener	500,000
Myers	90,000
Norman	400,000
Sauntry-Alpena	1,600,000
Sellers	244,000
Spruce	750,000
Uno—North	275,000
Uno—South	875,000
Vivian	15,000
Winifred	40,000
Total	20,464,000

PICKANDS, MATHER & CO.

Albany	350,000
Bangor	130,000
Corsica	250,000
Elba	125,000
Hudson	250,000
Malta	90,000
Minorca	80,000
Mchawk	200,000
Scranton	240,000
Troy	70,000
Utica	350,000
Virginia	350,000
Yawkey	50,000
Total	2,535,000

REPUBLIC IRON & STEEL CO.

Bray	100,000
Franklin	50,000
Kinney	500,000
Monica	75,000
Onondaga	40,000
Pettit	200,000
Schley	200,000
Union	285,000
Total	1,450,000

M. A. HANNA & CO.

Brunt	200,000
Croxton	75,000
Hanna	300,000
La Rue	250,000
Sliver	325,000
Total	1,150,000

JOSEPH SELLWOOD GROUP OF MINES.

Adriatic	125,000
Cyprus	100,000
Morrow	100,000
Pearson	125,000
Perkins	150,000
Total	600,000

THE SHENANGO FURNACE CO.

Shenango	1,000,000
Webb	300,000
Whiteside	300,000
Total	1,600,000

JONES & LAUGHLIN STEEL CO.

Fowler-Meadow	100,000
Grant	650,000
Leetonia	500,000
Lincoln	200,000
Longyear	200,000
Total	1,650,000

PITT IRON MINING CO.

La Belle	15,000
Miller	350,000
Ruddy	40,000
Total	405,000

A. B. COATES GROUP OF MINES.

Madrid	95,000
Section 17	30,000
Seville	5,000
Total	130,000

CORRIGAN, MCKINNEY & CO.

Stevenson	600,000
Commodore	1,000,000
Total	1,600,000

INTERNATIONAL HARVESTER CO.

Agnew	100,000
Hawkins	500,000
Total	600,000

OGLEBAY, NORTON & CO.

Woodbridge	150,000

BUFFALO & SUSQUEHANNA CO. (Rogers-Brown Ore Co.)

Iroquois	150,000
Susquehanna	1,100,000
Total	1,250,000

NEW YORK STATE STEEL CO.

Knox	20,000

INLAND STEEL CO.

Grace	100,000
Laura	200,000
Total	300,000

MAHONING ORE & STEEL CO.

Mahoning	2,000,000

TOD-STAMBAUGH CO.

Morton	150,000

CLEVELAND-CLIFFS IRON CO.

Crosby	250,000

BIWABIK MINING CO.

Biwabik	300,000

MERIDEN IRON CO.

Pearce	120,000

SWALLOW & HOPKINS.

Helmer	50,000

CAVOUR MINING CO.

Cavour	150,000

MORRIS IRON CO.

Allen	50,000

THOMAS FURNACE CO.

Williams	135,000

WHITE IRON LAKE IRON CO.

Euclid	25,000
Grand Total	37,134,000

Stripping With Dredges

Undaunted by its failure to make a success of the grab system in stripping overburden, an experiment with which was conducted a few years ago at the Grant mine, to be succeeded by the adoption of the common method of employing steam shovels, the Interstate Iron Co. of the Jones & Laughlin Steel Co., Pittsburgh, is about to try an entirely new plan in removing the surface material overlying ore deposits on the Mesaba range. The plan will be tried in the Grand Rapids district, near the Mississippi river, where the company several months ago obtained control of large mineralized areas. Dredging is the method to be given a test. For over a quarter of a century the steam shovel has been used extensively in removing overburden and in mining work. For that reason there is keen interest in the result of the new experiment. The Jones & Laughlin engineers believe the scheme feasible, with conditions such as they exist.

Itasca county, in which the Grand Rapids district, Mesabi range, is located, shipped 5,464,649 tons of ore during the fiscal year ended June 30, according to figures compiled by Capt. P. L. Ramquist, mine inspector. The outgo the preceding year was 4,622,-191 tons. There were employed last year a total of 2,306 men. From the 99 mines in operation in St. Louis county, in which is the bulk of the Mesabi range, 30,101,451 tons of ore were shipped last year, according to the annual report of the inspector for that jurisdiction, W. H. Harvey. The men employed numbered 16,048. Of the total outgo, 11,651,775 tons came from underground workings and 18,-449,719 tons from open pits. A total of 10,812,529 cubic yards of stripping was removed during the year. The accidents were fewer than in previous years. There were 44 fatalities, a rate of 2.79 per thousand men employed; 684,124 tons of ore were mined for each fatal accident, and 396,071 for each serious injury, the latter numbering 76. Twenty-nine fatal accidents occurred underground and 15 in connection with surface and open pit work. Twenty-five per cent resulted from falling ledges or cave-ins, 18 per cent from cars and locomotives, 9 per cent from explosives and 7 per cent from skips and cages.

FOREIGN MARKETS

BRITISH IRON TRADE

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Sept. 13.

Pig Iron.—The pig iron market shows a slight improvement in the matter of volume and inquiry, although prices show no improvement. Purchases are still strictly for small quantities, but these increase in number. Smelters are bitterly complaining of the unprofitable prices prevailing, and declare that some of the contracts lately made will involve actual loss. Eight furnaces in the Midlands are being blown out. Neither sellers nor buyers show any desire to make long contracts, but sellers are rather more confident than they were. The demand for foundry iron keeps up wonderfully well, thanks to the activity of engineering, but in all parts of the country forge iron is going into stock. There is a general belief that consumers must come on the market shortly. Cleveland iron has given way a little during the week, in spite of the more pacific international outlook. The selling price at Middlesbrough, yesterday, for No. 3 was 54s 8d ($13.38), with 55s 6d ($13.58), three months. The amount in store at Cleveland is now 175,000 tons. The stock continues to reduce, regardless of price fluctuations.

Finished Iron and Steel.—There were slight signs of improvement at the Birmingham meeting on Thursday, and apparently there has been a little increase in the number of small orders given out. But there are great complaints of severe cutting in prices. For unmarked bars, prices are being squeezed down, so that it is now possible to buy as low as £7 5s ($35.46) to £7 7s 6d ($36.06). There is a rather better demand for strip iron for tubes. In this branch, while there is a fair volume of business, this is largely due to arrears left over from the strike. Competition from Germany is increasing.

The continental demand for high-class steel for automobile and other purposes necessitates a steady growth of production, and Sheffield makers express very strong hopes that the lower duties under the United States tariff bill will enable them to extend their business in America. Under the new tariff, the duties on a number of Sheffield products are reduced on an average of 50 per cent, and are now very far from being prohibitive. It is hoped here that it will be possible to do more trade in tool steel, wire, cutlery and certain descriptions of special steel.

FRENCH IRON TRADE

Paris, Sept. 4.—Whatever slackness may have been experienced in the metal and allied trades in England, Germany and Belgium during the recent months does not appear to have infected the industry in France. Advices from the chief centers of the French iron and steel trade speak of a generally healthy condition of affairs, particularly in regard to the armament branches.

In the eastern French region cast bar iron is worth 180-182 francs ($34.20-$34.58) in small quantities; 175 francs ($33.25) for medium quantities; and large parcels can be bought at 170 francs ($32.30). The price of No. 2 quality is 2.50 francs (47½ cents) less. Band iron, which was 225 francs ($42.75) at the beginning of the year, can now be had at 190-195 francs ($36.10-$37.05), but there are works that are selling small quantities at 200 francs ($38). The sheet market is running at about 210-220 francs ($39.90-$41.80) for 3 millimeter plates, which, however, is not willingly paid. The Belgians are competing with French producers of bar iron in the north of France and both Belgians and Germans in plates. Bar iron is quoted from 165-170 francs ($31.35-$32.30) for small parcels. Large parcels can be had at 160 francs ($30.40) and band iron at 200-205 francs ($38-$38.95); plates, 3 mm., are 200-210 francs ($38-$39.90).

RUSSIAN IRON TRADE

St. Petersburg, Sept. 3.—The prices at Kharkoff for iron are: Merchant iron, 1 rouble 44-53 copecks (73-77½ cents) per pood (36 pounds); girder iron, 1 rouble 46-54 copecks (74-78 cents); tank iron, 1 rouble 60-65 copecks (81-83¼ cents) roofing iron, 2 roubles 10-20 copecks ($1.07-$1.12) at factory; cast iron, 70-72 copecks (35-36 cents) at works. The market shows no signs of slackening off. All kinds of iron are reported in the Moscow district to be scarce and it is difficult to get pig iron there under 90-95 copecks (45.47½ cents) per pood.

BELGIAN IRON TRADE

Brussels, Sept. 4.—Metallurgy in Belgium is improving in tone, although prices are not yet as satisfactory as might be. The bad period appears to be past and from week to week there is an appreciable improvement. It is expected that prices will remain quite as good as now for some time. Export prices for steel bars are about £4 16s ($23.37); iron, £4 18s ($23.85); rods, £5 3s ($25.07); girders, £5 11s ($27.02); steel plates, ¼ inch, £5 7s-£5 8s ($26.04-$26.29); ⅛ inch, £5 9s-£5 10s ($26.53-$26.77); 1/16 inch, £5 13s-£5 14s ($27.50-$27.75); and sheets, £6 10s ($31.64) per ton. In the country quotations are 13.25 francs to 13.50 francs ($2.51¼-$2.56½) for steel bars; 14 francs ($2.66) for iron bars: 13 francs ($2.47) for rods; 14-14.25 francs ($2.66-$2.70¾) for heavy steel plates; 16.50 francs ($3.13) for girders; and 17.25 francs ($3.27¾) for sheets. The rail market is well maintained and there is a strong demand also for accessories, particularly for Brazil, the Argentine and the west coast republics of South America.

GERMAN IRON TRADE

Berlin, Sept. 4.—The Siegerlander Ironstone Syndicate shows a continuously increasing production from 193,910 tons in May to 196,481 tons in June and 209,115 tons in July. There is a splendid current of both inquiries and sales and during the next few months there is not the slightest apprehension as to the course of business. The German southwest iron market presents a somewhat puzzling situation for the heavy industries. Bar iron, which had dropped from 125 marks to 90 marks ($29.37½-$21.15), is picking up again, and has made 96 marks ($22.56) per ton; and it is felt that this rise will be improved on; while plates on the other hand have lost value considerably along with black and galvanized gas pipes. Section iron remains about as before. There is not much being done in the wire market, and prices are giving way, buyers being particularly reserved. Crude iron is still in good demand and no complaints are made of it. The improved tone in the bar iron market is ascribed to good export orders and at present seems to be of a permanent character.

MEN OF THE IRON TRADE

J. P. MORGAN sailed recently for his annual vacation abroad.

EDGAR HAMILTON, secretary and treasurer of the United States Steel Furniture Co., recently retired from active business.

NICHOLAS F. BRADY has been elected a director of the New York Air Brake Co., to succeed his father, the late Anthony N. Brady, who has been a director for 18 years.

EDWIN P. CHAPMAN, for several years president and manager of the Sherwood Metal Working Co., Syracuse, N. Y., has been elected president and managing director of that company.

C. S. MOONEY, works manager of the Aurora Automatic Machinery Co., has been appointed superintendent of the Webster Manufacturing Co. at Tiffin, O., appointment to take effect Oct. 1.

JAMES G. HEASLET, chief engineer of the Studebaker corporation, has been placed in general supervision of all Studebaker automobile manufacturing, receiving direct reports from superintendents of all the corporation's plants.

FREDERICK G. CLAPP, of the Associated Geological Engineers, Pittsburgh, who recently returned from the gas fields of Hungary, has gone to New Brunswick with Lloyd B. Smith and Byron L. Fuller, both of the same bureau.

F. GOODWIN EVATT, superintendent of the Durant-Dort Carriage Co., of Flint, Mich., has tendered his resignation to become general manager of the vehicle division of the Ames Buggy Co., of Owensboro, Ky. He takes his new position Oct. 1.

F. S. SCOVILLE, formerly secretary and sales manager of the H. E. Mills Mfg. Co., Syracuse, N. Y., is now associated with the Standard Sand & Machine Co., Cleveland, and will devote his efforts to the sale of mixing, screening and sand conveying equipment for foundries.

ROBERT A. CHADWICK JR., for several years associated with the National Bridge Co., Nashville, Tenn., recently opened offices at 506 Empire building under the name of Chadwick & Co., contracting engineers. The newly-organized company will act as special agent for the National Bridge Co.

CARL O. Y. MONTELIUS, assistant chief engineer, and Hugo M. Rahmber, electrical engineer of the Swedish state railway, were in Toronto, Ont., last week in the course of a tour of inspection of transmission power plants, which they are making in view of the proposed electrification of portions of the Swedish railway system.

JAMES DUANE JR., superintendent of the Pittsburgh Crucible Steel Co., Midland, Pa., resigned his position Aug. 15 to take effect Oct. 1. He has made a remarkable record with one of the largest modern single blast furnace plants in this country making basic iron. The furnace has entered the eighth year on one lining, which, from present indications bids fair to last two or three years longer.

GEORGE E. SCHUHMAN, general manager of the Reading Iron Co., Reading, Pa., recently acted as host to the 25 members of the Corda Fratres, students and alumni of various German universities who are making a six-weeks' tour of the principal American cities, accompanying the delegation on a tour of the plant of the American Iron & Steel Mfg. Co. and the tube and other mills of the Reading Iron Co.

NORMAN B. REAM, director of the United States Steel Corporation and prominently identified with other industrial banking and railroad corporations, is recovering from two serious operations undergone recently at New York City. Although 70 years of age, Mr. Ream's rugged constitution has enabled him to withstand the severe shocks from these operations. He is now at his summer home at Thompson, Conn.

MAJOR JOSEPH T. SPEER, president of the Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, presided at the annual company dinner last week, at which he was presented a silver loving cup by employes as a testimonial of their regard. The event happened to fall on the major's birthday, and a part of the program was the placing of a huge birthday cake before him. Elbert Hubbard was guest of honor and speaker of the evening. His subject was "Get Together."

CHARLES L. BENJAMIN, advertising manager and director of publicity for the Cutler-Hammer Mfg. Co., of Milwaukee, was elected president of the Advertisers' Club of Milwaukee, at the recent annual meeting. Mr. Benjamin was one of the founders of the organization and during the past year served as vice president. Robert P. Spencer, advertising manager for the National Enameling & Stamping Co., with headquarters at the Milwaukee plant, was re-elected treasurer for the fifth time.

GEORGE H. BENZENBERG, one of the best known municipal engineers in the United States, now engaged in private practice, has declined to serve as a member and chairman of the Milwaukee municipal sewage commission, which is to be entrusted to the execution of a $15,000,000 sewage project. Mr. Benzenberg served as city engineer of Milwaukee for many years, resigning about ten years ago to assist the city of Cincinnati in a large municipal engineering project. At present he is supervising engineer on the construction of the Northwestern Mutual Life Insurance Co.'s $2,500,000 home office building at Milwaukee.

TRADE NOTES

BOSTON.—The Draper Co., Milford and Hopedale, Mass., is building 58 dwellings for employes, at a cost of $500,000.

CHAMPAIGN, ILL.—The Burr Foundry Co. has moved into its new North Works, and is remodeling the city plant into an auto sales department and shop for the repair of automobiles and specials.

CLEVELAND.—The Cooke-Wilson Co., manufacturers' agent, has moved its offices from 614 Columbia building to 1114 Williamson building.

DETROIT.—W. W. Totman, Whitney Mfg. Co., Hartford, Conn.; H. S. Harrison, Penn Spring Works, Baldwinsville, N. Y.; F. A. Close, Uniontown, Pa.; J. M. Wilson, New York City, and E. W. Brackett, Newark, N. J., are among representatives of prominent eastern industries calling on the Detroit trade last week.

JERSEY CITY, N. J.—The Union Tool & Supply Co. has taken out incorporation papers under the laws of New Jersey for $10,000.

MERRILL, WIS.—The Merrill Iron Works has recently booked orders for more than 30 carloads of castings for paper and pulp mill machinery for northern Wisconsin manufacturers and is experiencing the busiest season in its history.

MILWAUKEE.—An involuntary petition in bankruptcy has been filed by four Milwaukee creditors of the Keelyn Electric Co., Milwaukee. The largest of these creditors is Julius Andrae & Sons Co., Milwaukee, with a claim of $7,803.91. The Keelyn company manufactures motors and does electrical contracting.

MONTREAL.—The Industrial Engineering & Machinery Co., Ltd., of Montreal, have taken the agency for the chain belt concrete mixers manufactured in Milwaukee, Wis., and will act as exclusive agents.

MONTREAL.—The Canadian Pacific railway has had constructed by the American Car & Foundry Co. two cars especially equipped for fire fighting. Each car carries a tank of 8,428 imperial gallons capacity, and on the end of each there is a 7 x 10 x 10-inch duplex fire pump.

NEW HAVEN, CONN.—The New Haven Iron & Steel Co. will hold its annual meeting Oct. 6.

NEW HAVEN, CONN.—The Standard Wash Tray Works is erecting 60 houses for use of its employes.

PHILADELPHIA. — Andrew Wheeler, of Morris, Wheeler & Co., iron and steel merchants, has been appointed receiver for the Philadelphia Iron Works, which recently was adjudged an involuntary bankrupt. The security was placed at $30,000.

PITTSBURGH.—The Blaw Steel Construction Co. has moved its general offices from the Westinghouse building, Pittsburgh, to new office buildings recently completed at its works at Hoboken, Pa. A Pittsburgh sales office will be maintained in the Farmers' Bank building.

RACINE, WIS.—The Mitchell-Lewis Motor Co. has amended its articles to the effect that the management of the institution by the executive committee is abolished and returned to the general officers of the company. When the company negotiated a loan of $2,000,000 in August, 1911, the bankers were given representation on the executive board, which was then given the entire managerial power. Last spring Capt. Wm. Mitchell Lewis, president and general manager, resigned, and J. M. Winterbotham, until then a representative of the bankers on the board, was elected to succeed him. The recent amendment to the articles places the method of doing business in the same state it was before the loan was made.

NEW BUSINESS

The machinery market in some centers has continued to mark time, while at other points there appears a material increase in business activity. Certain classes of manufacturers, as automobile builders, are decreasing their working forces, but that is to be expected at this time of the year, and really bears little significance in relation to general industrial conditions as compared with similar periods of previous years. As a whole, inquiries appear to be picking up, and it will only be a matter of a comparatively short time until the general buying movement, delayed for the past three months, is resumed.

In New York, the machinery market has experienced considerable improvement during the past week. Sales have been made in greater volume and inquiries are being received more abundantly than was the case a week or 10 days ago. The New York Central railroad has asked for bids on some 14 machine tools for installation in its car shops at Albany and Buffalo. Included in the inquiry are five or six punch presses, a driving wheel lathe, a pipe machine, a wheel press, a car wheel lathe and miscellaneous tools. The New York Ship Building Co., Camden, N. J., has issued a list of 44 machine tools for installation on a new United States destroyer. All the equipment for a complete machine shop is included. It is expected that the navy department will soon issue a list of machine tools to be installed aboard the battleship Pennsylvania. The Johnson Van Vlaanderen Machine Co., Paterson, N. J., has purchased a few tools in this market. No action has yet been taken regarding the lists recently put out by the Boston & Maine and Pennsylvania railroads. A large quantity of machinery business for shipment abroad has been booked this week.

In Pittsburgh, builders of heavy rolling mill machinery and equipment are enjoying excellent conditions. Shops are busily engaged and new orders are coming in at a satisfactory rate. Some of the larger foundry interests have enough orders on their books to assure activity for several months. Machine tool dealers say the first half of September failed to develop an expected buying movement, but demand for single tools has not fallen off and in the aggregate orders represent a fairly satisfactory volume of business.

In Chicago, the machinery trade continues irregular. Manufacturers in general are expanding cautiously and this naturally curtails the demand. Apparently September will not show much improvement over August. Power plant equipment is moving more rapidly than most other kinds of machinery.

In Cleveland, there has been practically no change noted in the machine tool trade. Some of the dealers are feeling a little more optimistic regarding the early future, but all are more or less disappointed that business has not become more active with the advance of autumn. Several companies in this district have recently purchased a few tools for replacement. The Lake Shore is in the market for several small lots for installation at various points on its system, but has set no date for closure. Nothing new is evident on several large inquiries previously mentioned. It is reported that a large lot of second hand equipment has been purchased by a Cleveland supply house, but this is not confirmed. Electrical equipment, supplies and second hand tools continue fairly active. Several corporations in this district have increased their capital stock materially during the past few days.

In Cincinnati, several plants are adding to their present equipment, and the railroads have been better buyers during the past month than for some time. Business done in September up to the present time compares favorably with that of last month. Second hand machinery is holding its own. The foundries are naturally somewhat busier following the settlement of the recent strikes. Small electrical equipment continues fair, and special machinery makers are enjoying perhaps the best business in comparison with the different kinds of machinery made here.

CALIFORNIA

MONTAGUE.—An election will be called Oct. 20 for the issuance of a $25,000 bond issue for the installation of a municipal water-works system.

NORTH VAN NUYS.—The Western Iron & Supply Co. has been incorporated; $15,000; by J. H. Kibler, H. Ash and J. D. Evans.

REEDLEY.—An election will be held to vote on the issuance of a $35,000 bond issue for the installation of a water-works system.

RICHMOND.—M. B. Lewis, of San Francisco, has purchased a site here, and will erect a large assembling plant for gas stoves and ranges. It is rumored that building operations will commence at an early date.

SEARLES.—The Foreign Mines Co., Ltd., has been awarded the contract for 32 miles of railroad from the Southern Pacific here to Trona Lake, where works for making borax, soda ash, bicarbonate of soda and potash will be established. Guy Wilkeson, promoter.

COLORADO

CAMBRIDGE.—The Riverside Boiler Works has been incorporated to manufacture galvanized iron and steel range boilers and expansion tanks; $300,000; by J. S. Nichol, president, J. J. Martin, vice president, and J. A. Trout, treasurer and general manager. A four-story addition is now under construction.

DENVER.—It is announced that the plant of the Plattner Implement Co. will be enlarged in the near future, improvements estimated to cost approximately $50,000.

DENVER.—The Hercules Tunnel Machine & Development Co. has been incorporated; $1,000,000; by J. A. Smith, H. A. Recen and A. F. Recen, all of Denver.

DENVER.—The High Speed Wrench Co. has been incorporated; $200,000; by F. McLaughlin, H. R. Wade and C. D. Wilson, all of Denver.

PUEBLO.—The pattern room of the Pueblo Foundry & Machine Co. was damaged by fire recently.

CONNECTICUT

ANSONIA.—The Ansonia Electrical Mfg. Co. is increasing its capacity by adding two stories to its building.

HARTFORD.—The Abbott Ball Co. is about to erect an additional building at its Elmwood plant. It will be 50 x 125 feet, one story, of brick and steel construction.

NEW BRITAIN.—The New Britain Machine Co. has purchased a site opposite its

present plant, across the New Haven tracks, and will build an extension to its present plant.

NEW HAVEN.—The Winchester Repeating Arms Co. is putting up a drop forge shop, 52 x 112 feet, concrete and steel, with walls and roof of glass in steel frames.

NEW HAVEN.—The Lionel Mfg. Co., manufacturer of electric toys, is about to erect a new two-story, reinforced concrete building, 65 x 129 feet. A separate building will also be constructed to house the power plant and the boiler room.

WATERBURY.—The American Brass Co. is planning to add a two-story brick and steel building to its Benedict & Burnham plant here.

WATERBURY.—The Plume & Atwood Mfg. Co. is building a two-story brick addition, 24 x 25 feet.

WATERBURY.—The Manufacturers' Foundry Co. has completed a new pattern storage building.

WATERBURY. — The National Mfg. Co., Waterbury, Conn., which is to make seamless tubing, has bought a tract near to the plant of the Waterbury Rolling Mill Co., and is to build a two-story brick and steel factory, 70 x 100 feet.

DELAWARE

NEW CASTLE.—The New Castle county levy court has awarded a contract for a bridge over the Christiana river, to cost approximately $187,592.

WILMINGTON.—Trustees of the Diamond State Steel Co. will receive sealed bids Oct. 22 for tools, supplies, etc., from its plant.

DISTRICT OF COLUMBIA

WASHINGTON.—The navy department is expected to call for bids some time within the next two weeks on a large quantity of machine shop equipment to be installed on board the battleship Pennsylvania.

WASHINGTON.—The Bureau of Supplies and Accounts, Navy Department, will receive bids until Oct. 7 for furnishing the following supplies: Schedule 5848, furnishing and erecting traveling crane; schedule 5847, electrically-driven deck winch.

WASHINGTON.—An American consul reports that a resident of his district wishes to get into communication with American manufacturers of complete outfits of motor-power harvesting and agricultural machinery. Address Bureau of Foreign and Domestic Commerce, referring to No. 11,640.

WASHINGTON.—Bids will be received by O. Wenderoth, supervising architect, treasury department, for the construction complete, including mechanical equipment of the United States post offices at the following places on date given: Ansonia, Conn., Oct. 21; Le Mars, Ia., Oct. 22; Casper, Wyo., Oct. 24.

WASHINGTON.—Sealed proposals will be received at the office of O. Wenderoth, supervising architect, treasury department, for the construction complete, including mechanical appliances, of the United States post offices at the following places on dates given: Douglas, Wyo., Oct. 29; Evanston, Ill., Oct. 31; Hendersonville, N. C., Nov. 15.

WASHINGTON.—The Bureau of Supplies & Accounty, Navy Department, will receive bids until Sept. 30 for furnishing the following supplies: Schedule 5836, pipes, pipe unions and fittings; schedule 5844, valves, screws, etc.; schedule 5834, round iron bars for the manufacture of chain cable, hardware, wrenches, etc.; schedule 5842, railroad rails, etc.; schedule 5845, twist drills.

GEORGIA

THOMASVILLE.—The plant of the Tallahassee Sawmill Co. was damaged by fire recently. The loss is estimated to be approximately $150,000.

IDAHO

KETCHUM.—Plans are being prepared for an electric light and pumping plant and a new hotel for Guyer springs, a bathing resort near here.

LEWISTON.—The council has declared its intention of creating a large sewer district in Clearwater addition.

ILLINOIS

ASTORIA.—The Macomb Sheet Metal Wks. has increased its capital from $13,500 to $40,000.

CHICAGO.—The Taylor Portable Steel Derrick Co. has been incorporated to deal in derricks, cable, chains, etc.; $35,000; by J. L. Taylor, W. K. Rapp and A. L. Fries.

CHICAGO.—The Henes Sales Corporation has been incorporated to deal in tools and machinery, etc.; $25,000; by H. W. Henes, A. C. Jones and K. L. Shanley.

CHICAGO.—The Pyott Foundry Co., manufacturer of cast iron pulleys, is planning to erect a new plant at North Forty-sixth avenue and West Lake street, at a cost of approximately $200,000.

EAST ST. LOUIS.—The Harvard Mfg. Co. has been incorporated to deal in machinery, etc.; $4,000; by E. F. Cook, F. Kirsch and H. F. Haarstick.

HARVARD.—Hurst-Helm-Ferris & Co. advise that their new plant is practically completed.

MOLINE.—The Deere & Mansur Foundry recently awarded the contract for additions to its foundry and core room estimated to cost $25,000. The main building will be 80 x 200 feet, of saw-tooth construction. P. H. Lorenz, contractor.

INDIANA

CRAWFORDSVILLE.—The American Motor Wheels Co. has been incorporated; auto trucks, etc.; $600,000; by W. H. Owen, S. C. Rowland, J. V. Wilson, E. G. Darnell, G. Howell, F. M. Boyd and C. M. McCabe.

EVANSVILLE.—The International Steel & Iron Construction Co. advises that a number of punches and drills will be required for its new plant, which is to be operated by electric current.

NEW ALBANY.—Peter Jacobson & Sons will begin the construction of a new furniture factory at once. A site was deeded to the concern by the chamber of commerce.

NEW ALBANY.—Harry E. Heimberger may be addressed regarding plans for the erection of a new saw and veneer mill by the H. E. Heimberger Veneer & Lumber Co.

IOWA

DAVENPORT.—The foundry of the Red Jacket Pump Co. was damaged by fire recently, entailing a loss of $8,000.

ESTHERVILLE. — A special election will be held Oct. 7 to decide upon the construction of a steel and concrete bridge over the Des Moines river, estimated to cost $15,000.

KENTUCKY

BARBOURVILLE.—The Raccoon Coal Co. recently started operations in its new $25,000 plant.

BARBOURVILLE.—The Leoneys Creek Coal Co. has been organized by Barbourville business men and will install a mining plant at once.

CARLISLE.—The municipality is preparing to have preliminary plans for a water system drawn. A bond issue will be needed to finance the undertaking.

FULTON.—The Fulton Electric Light & Power Co. plans to increase the capacity of its power plant from 100 to 250 horsepower. A new boiler will be installed.

LOUISVILLE. — The Pennsylvania Lines wil begin the reconstruction and double tracking of bridge across the Ohio river here in the immediate future.

LOUISVILLE.—The Imperial Wire & Iron Works, which has been considering building a new factory, will have plans in definite form within the next two weeks.

LOUISVILLE.—The Norman Lumber Co. will require an additional boiler for its sawmill at Holly Ridge, La. Address A. E. Norman, president of the company.

LOUISVILLE.—Mason Maury is drawing plans for an apartment hotel to be used exclusively by women. A steam heating plant and other equipment will be needed.

LOUISVILLE.—An elevator will be installed in the building of the Great Southern Fire Insurance Co., which has been leased to the Kentucky Athletic Club and will be remodeled.

LOUISVILLE.—The Henry Vogt Machine Co. has the contract for the boiler to be installed in the heating plant of the Brandeis school. Neville, Kellner & Co. are the contractors.

PADUCAH.—F. M. Fisher will let a contract for a $7,500 lighting plant to be installed for the New Century Hotel Co. at Dawson Springs, Ky.

PERRYVILLE.—W. J. B. Debaum will let contracts for doubling the capacity of his electric light and ice plants.

MAINE

PORTLAND.—Fire recently damaged the plant of the W. A. Allen Co., manufacturer of finished lumber and builders' finish. Estimated loss $25,000.

MASSACHUSETTS

BOSTON.—The New England Iron Works Co., 20-28 Fargo street, South Boston, has been granted a permit for the erection of a new brick and steel factory building.

MICHIGAN

DETROIT.—The Detroit Turbine Mfg. Co. has been organized; capital $50,000.

DETROIT.—The Michigan Coin Lock Co. has been incorporated; capital, $10,000.

DETROIT.—The Emerson Mfg. Co. has been organized to manufacture, buy and sell machinery; capital, $5,000.

DETROIT.—The Flyer Motor Car Co. has been incorporated; $100,000; by G. A. Milne, A. A. Gloetzner and Henry W. Campbell.

DETROIT.—Charles Amos & Co., structural steel makers, are having plans prepared for the construction of a new factory building. Burrows & Wells, architects.

DETROIT.—The Progressive Foundry Co. recently purchased three acres on which it proposes to erect a plant for the manufacture of drop forgings.

DETROIT.—The directors of the Michigan State Telephone Co. have authorized an appropriation of $450,000 for general improvements to the Detroit telephone system and the toll lines out of the city.

DETROIT.—Work will shortly be started on a large assembling shop, warehouse and sales building at Broad street and Lehigh avenue, Philadelphia, for the Ford Motor Co. Estimates on the structure, which will be nine stories, 232 x 320 feet, are now being submitted.

DETROIT.—The Detroit Metal & Steel Works, composed of Hugh McNeill, James Duross and W. F. Lindow, has engaged in business at Congress and First streets. The company is equipped to furnish and erect all kinds of iron and steel structural work for buildings. The officers of the company were formerly with the Henry B. Lewis Iron Works, of Detroit.

FENTON.—The Fenton Engineering Co., of Fenton, Mich., is working out the details of a cycle car to be known as the Signet, to list at about $400.

GRAND HAVEN.—The Ottawa Leather Co. has increased its capital from $600,000 to $1,000,000.

GRAND RAPIDS.—The Hirth-Krause Co. recently awarded contracts for the cement block power house now under construction.

GRAND RAPIDS.—C. H. Smith, of this city, has been awarded the contract for building the dam for the Boardman River Light & Power Co. at Traverse City. It is to be completed in three months.

JACKSON.—The Commonwealth Power Co. is planning to expend $50,000 on improvements in Jackson during the fall and winter.

LANSING.—H. W. Brown, of Lansing, has been chosen vice president of the Chatham, Ont., Mfg. Co., which has taken the shops and business of the Malleable Iron & Steel Co. The new concern will manufacture a complete line of hardware specialties.

MARQUETTE.—Pickands & Co. expect to build a new coal dock here, bids having already been asked. The work includes considerable coal-handling machinery. The plans call for rebuilding the present dock to a width of 45 feet for a distance of 500 feet. The cost will be about $100,000. On the new dock will be placed two Mead-Morrison unloading towers. There will also be a new screening house 50 x 35 feet, 35 feet high, equipped with a belt conveyor system for which power will be furnished by three 50-horsepower motors.

PONTIAC.—A reinforced concrete bridge will replace the wooden structure over the Clinton river.

SAULT STE. MARIE.—The Lake Superior Corporation recently awarded the contract for the deepening of its power canal from 18 to 24 feet to the Soo Dredging & Construction Co. The contract price is $300,000.

MINNESOTA

FAIRMONT.—The Fairmont Machine Co. has decided to remain in this city, following an agreement by the citizens here to float a $50,000 bond issue.

MISSOURI

JEFFERSON CITY.—The contract for Missouri's new state capitol will be let Nov. 6. It is stated that $3,500,000 will be expended on the building and its furnishings.

ST. LOUIS.—The Commercial Foundry Co. is planning to start construction work soon on its new quarters, to cost $10,000.

NEW JERSEY

CAMDEN.—The New York Ship Building Co. is asking for bids on 44 machine tools, to be installed on a new United States destroyer. The list includes a complete line of machine shop equipment. No heavy tools are included.

PATERSON.—The Johnson Van Vlaanderen Machine Co. has just purchased a Libby turret lathe, a Pratt & Whitney geared head lathe, an Eberhardt gear cutter and one or two other tools.

TRENTON.—The William R. Thropp & Sons Co., machinist and iron founder, has completed the remodeling of its plant. A new foundry, 80 x 160 feet, and a new storehouse have been erected.

TRENTON.—The Black Diamond Range Co., of Newark, has been declared bankrupt. The company's liabilities are placed at $40,000, with assets of $30,000. The range company was organized in 1910 with a capital of $125,000, and has its factory at Raritan, N. J.

TRENTON.—The Reeves-Cubberley Engine Co. has been incorporated to manufacture, sell and deal in engines, machinery, etc., and to carry on the business of machinist, metal worker, etc.; $50,000; by Clifton Reeves, Albert A. Taylor and William P. Cubberley.

TRENTON.—The plant of the Providential Tile Co. has been purchased at receiver's sale by Mrs. Emma C. Whitehead, of 502 West State street, this city. The plant has been idle for the past six months, and Mrs. Whitehead will shortly operate it and give employment again to several hundred hands.

TRENTON.—Plans have been prepared for the erection of four additional buildings to the New Jersey State Hospital for the Insane in this city. The structures will include a building for the criminal insane, power house, admission building and an addition to the laboratory building. The legislature appropriated $250,000 for the work.

NEW YORK

HUDSON.—Arthur Gifford, formerly general manager and treasurer of the Gifford Wood Co., of Hudson, N. Y., with R. D. VanValkenburgh and associates, have organized the Mechanical Handler Co., of Hudson, N. Y., with a capital of $100,000, for the purpose of manufacturing a complete line of elevating and conveying machinery. A modern plant of brick and steel fireproof construction is now being erected upon a site of about four acres. This will consist of machine shop, forge and pattern shop, foundry, warehouse and office buildings. The machine shop will be 70 x 150 feet and the foundry 65 x 135 feet in dimensions. Mr. Gifford, who is president of the company, was identified with Gifford Bros. from 1889 to 1905 in the manufacture of elevating and conveying machinery for handling ice. In 1905, the firm of Gifford Bros. was consolidated with Wm. T. Wood Co., of Arlington, in the formation of the Gifford Wood Co. Mr. Van Valkenburgh is treasurer of the new company.

LANCASTER.—The American Malleable Co. has increased its capital stock from $500,000 to $1,000,000 to make possible improvements to the company's plant. It is stated that over $200,000 has already been expended this year on improving and enlarging buildings and installing additional equipment.

LESTERSHIRE.—The Central Flat Iron Co. recently started business in its new building, manufacturing flatirons. Some machinery has already been installed and additional will be added as required.

NEW YORK CITY.—The George Bockhaus Co. has leased the Madison Iron Works the building at the southeast corner of Pleasant avenue for a long term.

NEW YORK CITY.—The Gallatin Iron & Steel Co., Inc., has been incorporated; $20,000; by F. Cornell, 923 Park avenue, and D. Grant, 833 Garden street, both of Hoboken, N. J., and G. W. Cortin, Newburgh, N. Y.

NEW YORK CITY.—The New York Central railroad has issued inquiries for bids on some 14 machine tools for installation in its car shops at Albany and Buffalo. The list includes five or six punch presses, a driving wheel lathe, a pipe machine, a wheel press, a car wheel lathe and miscellaneous tools. It is expected that the driving wheel lathe, the wheel press and the car wheel lathe will be closed for at once. The New York Central is also inquiring for some wood-working equipment.

POUGHKEEPSIE.—The Moline Plow Co. is contemplating the erection of a steel and brick pattern storage building, 30 x 98 feet. Building operations of the company in its branch in this city for one year aggregate $263,000 while other buildings are being planned for erection next year.

SCHENECTADY.—The General Electric Co. has under consideration the purchase of a large number of machine tools which it has recently inquired for.

SYRACUSE.—The U. S. Steel Furniture Co. has increased its capital stock from $400,000 to $500,000.

OHIO

AKRON. — The $2,000,000 hydro-electric power plant of the N. O. T. & L. railroad will be completed within 90 days.

AKRON.—The Akron Motorcycle Co. has been incorporated; $10,000; by A. J. Helman, A. W. Lees, W. L. Lawrence, H. Myers and H. H. Bowen.

BOWLING GREEN. — The Universal Machine Co. advises its recently noted increase of capital stock is to provide for additional machinery to put on the market a new line of patented roller bearing and three-piece universal joints for automobiles. Part of the new equipment has been bought and some is yet to be secured.

BOWLING GREEN.—Wood county commissioners let the contract for the New Rochester bridge to the Modern Construction Co., of Fremont, for $2,819.52. The sub-structure contract was let to C. D. Finch for $11,400. This bridge will be 234 feet by 18 feet. The contract for the Sieving bridge in Freedom township was let to the Home Engineering Co., of Canton, for $8,699 and the sub-structure contract to C. D. Finch, of Bowling Green, for $2,401.22.

CANTON.—The American Lawn Tool Co. has increased its capital from $10,000 to $30,000.

CINCINNATI.—The Cincinnati Stamping Co. has increased its capital from $75,000 to $100,000.

CINCINNATI.—The Cincinnati Car Co. is planning to expend approximately $30,000 in the establishment of an assembling depot in connection with the main plant here.

CINCINNATI.—The Cincinnati Precision Lathe Co. has increased its capital from $50,000 to $75,000. The company manufactures precision lathes, and has a factory in Mt. Washington, Cincinnati. It is quite probable that additional equipment will be installed.

CINCINNATI.—The L. Schrieber & Sons Co. has secured the contract for the iron work to be used in the addition to the Brighton German Bank building, Brighton, a suburb of that city. The contract calls for both structural iron and grille work, and will require several hundred tons.

CINCINNATI.—The Modern Machine Tool Co., Winton Place, has again increased its capital stock, this time increasing its common stock from $115,000 to $140,000. This company recently increased its preferred stock, but at a recent meeting of the directors it was decided to increase the common stock also. The company will increase its output and will soon install additional machinery.

CINCINNATI.—The Patented Specialties Co has secured the contract for the steel sash to be used in the large addition to the factory of the Globe Wernicke Co., in Norwood, a suburb of Cincinnati. This calls for a large amount of steel sash, as the building will be made entirely fireproof, and no wood will be used in any of the window frames. The L. Schrieber & Sons Co., also of Cincinnati, has secured the contract for the iron work to be used in the building. The work is in charge of the Roche-Brunner Building Co., of Cincinnati.

CLEVELAND.—The American Steel & Wire Co. will construct an addition to its plant on Wire avenue S. E.

CLEVELAND. — A close corporation has been formed of the Clay Engine Co., 6950 Kinsman road, maker of heavy duty gasoline and kerosene engines and boat and engine accessories by its recently noted incorporation. Officers of the new concern are: President, E. H. Clay; vice president, H. F. Smith; secretary-treasurer, P. R. Ward.

CLEVELAND.—The Hydraulic Pressed Steel Co. advises that the addition now being constructed at its plant will be used as a garage and no machinery equipment will be required.

CLEVELAND.—The Cleveland Knife Co. will erect a new plant, the main building to be 65 x 268 feet, one story, of brick and steel construction. The plant, when completed, is estimated to cost $30,000.

CLEVELAND.—The Eberhard Mfg. Co., Tennyson road S. E., is preparing to build an addition to its plant, 45 x 215 feet, two stories, to cost approximately $17,000. The first floor will be used for nickel plating and the second for buffing and polishing rooms.

DAYTON.—Officials of the Maxwell Motor Car Co. have visited the plant here with a view to increasing its present facilities. An addition is necessary.

DAYTON.—The Barney & Smith Co. has turned over to the Queen & Crescent a new dining car, the first of a series of five. The cars when fully equipped will cost approximately $25,000 each.

DAYTON.—The W. P. Callahan Co. is making extensive improvements at its plant. Contracts have been signed for the installation of a complete system of motor-driven machinery and the shafting will be displaced. The Callahan Co. is now at work on a special oil engine for the Fairbanks Co., of New York. Pres. R. J. Connelly reports a good line of orders for linseed oil machinery.

HAMILTON.—The Anderson Tool Co. advises that it is not contemplating any additions to its plant at Anderson, Ind., this year.

LIMA.—The Clark & Jones Heating & Ventilating Co. has been incorporated; $25,000; by J. Piper, F. J. Banta, E. M. Gooding, D. E. Baxter Jr., and W. A. Clark.

MANSFIELD.—The Richland Reduction Co. has been incorporated; $10,000; by W. K. Reed, J. B. Weigel, C. Hout, L. Brockman and F. A. Walter.

MASSILLON.—The Massillon Foundry & Machine Co. has increased its capital stock from $100,000 to $250,000.

MASSILLON.—The Peerless Drawn Steel Co. has been incorporated to manufacture steel products; $10,000; by J. G. Lester, W. A. Sonnhalter, N. W. Culbertson, F. H. Snyder and F. W. Arnold. The company will occupy the former plant of the Massillon Bridge & Structural Co.

NEWARK.—The Newark Ohio Tool Co. has been incorporated to manufacture bolt tools; $50,000; by W. A. Ermen, president.

STEUBENVILLE. — Follansbee Bros., Follansbee, Ky., announce the erection of a new brick plant and the opening of coal mines at Irondale. The completion of this work means an expenditure of $100,000. The new plants will be in operation by January, 1914. A one-story brick building, 50 x 200 feet, and 12 kilns are included in the plans.

TOLEDO.—The Hanahan-King Co. has secured the contract for constructing a 4,000-foot breakwater at the east end of the Grand reservoir, near St. Marys, O.

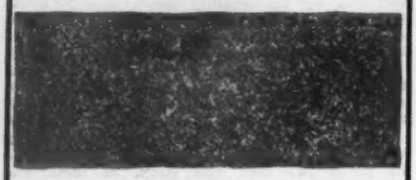
TOLEDO.—The Charpiot & Mills Mfg. Co. has been incorporated; all kinds of sheet metal products; $20,000; A. E. Meyer, T. S. Powell, N. J. Beil, G. E. Neilson and Nat Smalley.

TOLEDO.—The contract for the erection of the Lake Shore repair shops at Air Line Junction was recently awarded to the Bentley & Sons Co. Twelve buildings are planned, covering 200 x 200 feet. Estimated cost $300,000. Work is planned to be completed within four months.

TOLEDO. — Bridge improvements were awarded recently by Lucas county commissioners. The contracts include new piers and abutments for old structures and will amount in the aggregate to approximately $27,000. The larger portion of these contracts were secured by the Toledo Bridge & Crane Co.

TOLEDO.—The Jos. L. Skeldon Engineering Co. has taken over the shop formerly occupied by Young & Gray on Summit street,

Woodmansee & Davidson, Inc.
ENGINEERS
All Kinds of Power Plants
SPECIALISTS in the Industrial
Application of PRODUCER GAS
MILWAUKEE Wells Bldg. **CHICAGO** 1st National Bank



TREATED

Useful strength - 175,000 lbs. per sq. in.
Hardness - - - 40 units
Toughness - - - - 60 units
Resistance of fatigue - 1,000 units

Know Your Steel

Do you, Mr Manufacturer, know that today there are more than 300 different combinations of alloys of steel, any one of which can be scientifically heat treated?

This as against the two classes of steel—tool and structural—that the manufacturer of ten years ago had to work with.

Which one of these more than 300 combinations is the best for a specific purpose? Do you know, **positively?**

To properly select the **right** steel for a certain purpose from the many different combinations of alloys and heat treatments, extending into the thousands, is the work of a steel expert or metallurgist. We extend this service **free** to our clients at all times.

Commercial Heat Treating and Scientific Case Hardening

We offer the best facilities in the country for this work. We can help you in design and construction, and what we save through decreased weight and increased strength is worth while.

Our service allows the small manufacturer to enjoy the same advantages as the largest and with our help, every steel user can produce better results.

Send for our booklet—it is interesting.

The Steel Improvement Co.
Cleveland, Ohio

Compare the micro-photographs at the top and bottom of this advertisement. These were made from our NSI-30, intended for parts subjected to severe strains and shocks.

UNTREATED

Useful strength - 60,000 lbs. per sq. in.
Hardness - - - 30 units
Toughness - - - - 60 units
Resistance of fatigue - 10 units

and will use it as a repair shop and storage room in the machinery business. This company was this week awarded the contract for a new combined dredging pump and engine for the department of harbors and bridges of Toledo. Edward R. Young, formerly with the Young & Gray Co., is now with the Skeldon Co., and will occupy offices in suite 356-359, Spitzer building.

TROY.—Awards for bridge structures in Miami county were recently made. The concrete bridge over Stillwater at Covington was awarded to Hanneman Bros. for $26,119.15. The contract for the Coon bridge was secured by the King Bridge Co., for $10,675. A number of smaller contracts were awarded at the same time. These awards are for bridges washed out by the flood of last spring.

UNION CITY.—The Union City Ohio Electric Co. has been incorporated; light, heat and power; $5,000; by C. F. Chapman Jr., C. McArich, H. W. Isenberg, N. A. Tracy and F. W. Welsey.

YOUNGSTOWN. — The Trussed Concrete Steel Co. has purchased 17 acres of land south of its plant at Crab Creek, upon which it intends to build in the near future.

YOUNGSTOWN.—Bids will be opened Oct. 8 for the construction of a temporary bridge at Division street, material to be furnished by the county commissioners. Plans with county engineer.

JANESVILLE.—The war department has not approved the plans for the reconstruction of the bridge across the Muskingum river at Dresden.

OREGON

ALBANY.—The council has awarded the contract for a trunk sewer to James Kennedy Construction Co. of Portland, for $17,326. The Kennedy Co. was also awarded a $4,000 sewer contract in Oak street. The Elliott Construction Co. of Portland, was awarded two sewer contracts of $5,102 and $8,242 in Geary and Baker streets, respectively.

ASTORIA.—Wilson Bros. of this city, were awarded contract by United States government for survey cruiser for war department at $28,000.

ASTORIA.—J. A. Prouty will erect a sawmill and box factory on site he has leased from Seaside Power & Light Co. Work will begin at once.

BAKER.—Bids will be received Oct. 14 for $25,000 in bonds to pay for municipal lighting system.

MYRTLE POINT.—The Coos Bay & Coquille Valley Railway Co., Phoenix, Ariz., has filed declaration of intention to construct a road from this point up through the Coos valley. David Nelson, of Marshfield, Ore., is general agent.

PENNSYLVANIA

ALTOONA.—The Altoona Concrete Construction & Supply Co. has been awarded the contract for the new $50,000 home of the Brotherhood of Railway Trainmen at Eighth avenue and Eleventh street. The building will be four stories, of fireproof construction.

ERIE.—Work was recently started on the erection of an addition to the plant of the Bury Compressor Co., made necessary on account of increased business.

HARRISBURG. — The Altoona Northern Railroad Co., Altoona, has filed notice of an increase of debt to the extent of $750,000, and the Trenton City Bridge Co., Philadelphia, of an increase of debt to the extent of $350,000.

KITTANNING.—F. G. Ross, engineer, Pittsburgh, is preparing plans for a municipal water-works and lighting plant to be constructed here.

LANCASTER.—Plans are being prepared by F. H. Shaw for a municipal pumping station for Lancaster to cost about $12,000.

OIL CITY.—Additions to the equipment of the power plant of the Citizens' Traction Co., involving an outlay of $85,000, will be made this fall.

PHILADELPHIA. — The Associated Automatic Sprinkler Co. announces increase of capital stock from $100,000 to $250,000.

PHILADELPHIA.—The Philadelphia Rapid Transit Co. has awarded a contract for the erection of escalators to the Charles McCaul Co. Work will begin at once.

PHILADELPHIA.—The Schuylkill Iron & Steel Co. has awarded a contract for a blacksmith shop at its plant at American and Pike streets.

PHILADELPHIA.—Plans and specifications have been prepared for an extension of the engine house of the Philadelphia & Reading railroad, at Rutherford, Pa.

PHILADELPHIA.—William Sellers & Co., manufacturers of machine tools, are having plans and specifications prepared for a one and two-story brick, steel and concrete foundry, to be erected at Folsom, Pa.

PHILADELPHIA. — Joseph S. Miller & Co. have been awarded a contract for a complete electrical equipment in the Abington general hospital, Abington, Pa. Bissell & Sinkler, architects.

PHILADELPHIA.—Carl P. Berger has completed plans and is ready for bids on a two-story brick and concrete dyehouse and a one-story powerhouse, 90 x 90 feet, to be erected at Delaware avenue and Millner street. The structures will cost $100,000.

PITTSBURGH.—The Lockhart Iron & Steel Co. is building a warehouse to carry complete stocks of its products for distribution to the trade in this vicinity.

PITTSBURGH. — The Ruud Mfg. Co., maker of hot water boilers, will build a four-story brick and steel addition, the contract for which has been placed with J. A. Craig.

PITTSBURGH. — The Standard Sanitary Mfg. Co. has ordered two 250-horsepower water tube boilers, fired by Green chain grate stokers, from the Erie City Iron Works, Erie, Pa.

PITTSBURGH. — The Pittsburgh Pressed Machine Co., capitalized at $10 000, has been chartered to manufacture and sell all kinds of pressing machines, laundry machines, boilers, gas and steam fittings, etc. Herman B. Ferguson heads the new concern.

SHARON.—Delay from imperfect working of a large press has delayed the beginning of operations at the new plant of the Pressed Steel Products Co. at the Petroleum Iron Co.'s works near here.

WARREN.—Plans will soon be prepared for a power house for the Pennsylvania State hospital for the insane. Water-tube boilers to develop about 1,600 horsepower will be required. The building, when completed, will cost approximately $125,000.

WILKESBARRE.—The Universal Clamp Co. has been incorporated; $25,000; by Harry Murphy, Wilkesbarre.

YORK.—The Pullman Motor Car Co., Oscar Stevenson, treasurer, is increasing the capacity of its plant.

RHODE ISLAND

WOONSOCKET.—The Clinton Mfg. Co. advises it recently installed the following machinery in its new plant which was recently completed: Three Dillon boilers, high and low pressure Corliss engine, Sturtevant economizer, generator and motor.

TENNESSEE

CHATTANOOGA.—Henry Nyberg, an automobile manufacturer, is planning to increase the capital stock of his company and enlarge his manufacturing facilities.

NASHVILLE.—The Old Sol Hot Air Furnace Co., organized with J. D. Tipple president, will establish a plant for the manufacture of heating equipment.

NASHVILLE.—Machine tools will probably be needed by the Chester Motor Car Co., which has let contracts for the construction of a large repair shop.

OVOCA.—The saw and planing mills of Joseph Gunn, located at Rutledge Falls, near Ovoca, were burned recently with $10,000 loss. Plans for rebuilding will be considered.

RICEVILLE.—A plant will be established by the Riceville Knitting Mills, which has been incorporated with $35,000 capital stock by R. J. Fisher and others.

TEXAS

HOUSTON.—The Southern Engine & Pump Co. has been incorporated; $10,000; by C. W. Marlin, C. A. Leavens and W. B. St. John.

WASHINGTON

BELLINGHAM.—Officers of the Coast Clay Co. say the plant will be moved from its present location at South Bellingham to Chuckanut bay, where a $100,000 plant will be built.

ELLENSBURG.—The contract for a 2,050-foot tunnel in Cascade Irrigation district has just been awarded to Carlson, Chindahl & Co., and Hansen for approximately $29,000. The tunnel will be lined with concrete. Bids are being received now for galvanizing iron flume.

ELLENSBURG.—The Ellensburg Milling Co.

has been incorporated for $50,000 by B. F. Reed and J. C. Hubbell.

EPHRATA.—The county commissioners have awarded a franchise to operate a gasoline car line between this point and Soap Lake to W. M. Clapp, an attorney representing eastern investors.

EVERETT.—The Centrifugal Aeroplane Co. has been incorporated for $100,000 by Samuel McRae and C. S. McCoole and others.

NAPAVINE.—R. M. Shaver will erect a 20,000-foot capacity saw mill near here.

OLYMPIA.—The contract for the Nesika bridge has been awarded to Hunley & Henry, of Hoquiam, for $23,644.

OLYMPIA.—The state board of control will receive bids until Sept. 27 for one 300-horsepower horizontal tube boiler equipped with Jones stoker set up at power plant of Western Washington Hospital for Insane, at Steilacoom.

OLYMPIA.—Articles of incorporation for the Timber Products & Power Co. have been filed with state officials by Lester W. David, wealthy lumberman of Seattle, and others, with a capitalization of $4,000,000. The company plans to engage in the timber, mining and power business.

SEATTLE.—The Anderson Steamboat Co., Leschi Park, plans constructing a ferry and four 64-foot passenger boats.

SEATTLE.—The contract for sewers in Palatine avenue has been awarded by the board of public works to Frasca & Collucio for $87,355.

SEATTLE.—The Archer Blower Pipe Co., Station M., South Seattle, has secured a contract for remodeling the blower systems in the sawmills of the Gray's Harbor Commercial Co., of Cosmopolis, Wash.

SPOKANE.—The contract for the Union O. W. R. & N and Milwaukee depot has been let to Grant Smith & Co., Tacoma, Seattle and Spokane, for $650,000. The building will be reinforced concrete and steel with tile roof and four stories high.

SPOKANE.—The sewer contracts have been awarded by Commissioner of Public Works Z. E. Hayden. Dist. No. 956, lateral sewer was awarded to Jas. C. Broad, 604 Jamieson building for $13,065. Dist. No. 925 A., sub-trunk awarded to P. L. Langan, E. 2327 Boone avenue, for $13,064.

TACOMA.—The city council has announced plans for a $500,000 bond issue to be put up to the voters next April. Plans include $87,000 municipal railroad, trackless trolley or gasoline bus line over tideflats manufacturing district; 50-ton garbage incinerator to cost $50,000; $200,000 worth of trunk and lateral storm and sanitary sewers and breakwater at Old Town for fishing fleet.

WENATCHEE.—L. C. Wylie of Santa Ana, Cal., is contemplating the establishment of a foundry here.

WEST VIRGINIA

WHEELING.—The Wheeling Steel Casting Co. is building a 100-foot extension to its plant and is installing a 15-ton alloy steel furnace.

WISCONSIN

MADISON.—The Chicago & Wisconsin Valley Electric Railway Co. started work Sept. 15 on the interurban line between Madison and Portage, which must be completed by Jan. 1, 1915, under penalty of losing franchises. Work on the local lines in Madison is also to be commenced.

MENOMINEE.—The Wisconsin Construction Co., Chippewa Falls, was awarded the general contract for the erection and equipment of the new $75,000 industrial school building of the Stout Institute here. The building will be 84 x 175 feet, three stories and equipped for instruction in blacksmithing, plumbing, architectural and mechanical drafting and other trades.

MILTON.—The C., M. & St. P. Ry. Co.'s freight and passenger depot was destroyed by fire caused by lightning. It will be rebuilt at once.

MILWAUKEE.—The Allis-Chalmers Mfg. Co. awarded the contract for the erection of a new boiler and flange shop at West Allis to the American Bridge Co. The building will be used to house the departments that will be moved from the Chicago works late this year.

MILWAUKEE.—A building permit has been granted to the Geo. J. Meyer Mfg. Co., 576 Clinton street, machine shop and boiler works, for the erection of a $100,000 shop building at Lapham and Clinton streets. The building will be of brick and steel construction, three stories, 140 x 140 feet. This project was reported in THE IRON TRADE REVIEW several months ago.

MILWAUKEE.—Charles W. Somers, Cleveland, lessee of the Plankinton block property, Grand avenue, Second, West Water and Sycamore streets, has made announcement that work on the proposed improvements, involving more than $4,000,000 will positively begin Jan. 1, 1914. Mr. Somers announces that Harry Payne Whitney, Frank S. Butterworth and Louis E. Stoddard, of New York City, have become financially interested in the project. The structure will be the first of a group to cover a solid city block. It will be a combination theater, hotel and office structure, of steel and brick, 18 to 20 stories, 150 x 220 feet. George A. Harvey is Mr. Somers' personal representative in Milwaukee and H. Stanley Green will manage the property.

MOSINEE.—The village board awarded the contract for a 75-foot steel water tower for the municipal water-works system to the Wausau Iron Works, of Wausau, Wis.

NEKOOSA.—The village board is about to award a contract for a 50,000-gallon steel tank to be used as the main reservoir of the municipal water-works system.

OOSTBURG.—The Yale Steel Stamping Co. has been incorporated to do a general machine business; $75,000; by F. A. Tuschen, A. G. Schenerell and Dr. J. Schenerell, all of Ostburg.

PRAIRIE DU SAC.—The county board of supervisors will soon order estimates prepared for the proposed new intercounty bridge over Wisconsin river between Prairie du Sac and Sauk City, for which purpose the legislature contributed $75,000 at the recent session.

SHEBOYGAN.—The Optenberg Iron Works, Sheboygan, was awarded the contract for doing all structural steel work on the new store building and office structure to be erected at Sheboygan by Charles Eisenold.

SUPERIOR.—The Interstate Transfer Railway Co. has increased its capital stock from $50,000 to $1,500,000 to provide funds for the construction and equipment of the 12 miles of trackage needed to connect the present eastern terminus at Pokegama Junction with the proposed ore docks of the Steel Corporation on Wisconsin point. The railway will provide shipping and receiving facilities for the Corporation's new steel plant at the head of the lakes.

WAUKESHA.—The Werra Aluminum Foundry Co., which established a large shop in Waukesha in May, 1913, is now employing 200 skilled men and is so rushed with orders that more men are being added to the pay-roll as they can be procured. The company occupies a large part of the former Wisconsin Central (Soo Line) car and locomotive shops and plans to take more space shortly.

DOMINION OF CANADA

ALBERTA

EDMONTON.—A. M. Jeffries, city architect, has completed plans for a combination fire hall and police station to cost about $350,000.

CALGARY.—The city council contemplates the purchase, at a cost of $52,000, of fire apparatus. J. M. Miller is clerk of the council.

CALGARY.—Seven extensions will be made to the civic street car system. They will be from half to three-quatrers of a mile each.

MEDICINE HAT.—City Engineer Grimmer of Medicine Hat, is securing data from a number of United States cities as regards the installation of an improved street lighting system for Medicine Hat.

SOUTH EDMONTON.—George McLeod has been awarded a contract by the Canadian Northern railway for the erection of a station and freight sheds at $40,000.

BRITISH COLUMBIA

COLDWATER.—George Champe, a Toledo, O., civil engineer, has been engaged to prepare plans and estimates of cost for installing a municipal water-works plant for the village.

NELSON.—Arrangements are completed for ordering four electric locomotives costing $75,000 each for the Canadian Pacific railway's Castlegar to Rossland line. The West Koot-

Save your copies of

The Iron Trade Review

for future reference

BINDER CLOSED

We have arranged with the manufacturers of the Dowst Magazine Binder to supply us with that binder in quantities that enable us to sell them to our subscribers at $1.25 each postpaid.

BINDER OPEN

It is the only practical magazine binder which binds one or fifty issues with a neat book appearance. No springs, catches, strings, laces or locks. Complete, equipped to hold 26 copies of The Iron Trade Review, $1.25 postpaid. No mechanical labor necessary.

Simple—Practical—Durable

THE IRON TRADE REVIEW

CLEVELAND - OHIO

Penton's Book News

Publishers and Book Handlers

CLEVELAND

A Few of our Standard Publications.

PRACTICAL ALLOYING. By John F. Buchanan	$2.50
ALLOYS (Non-Ferrous). By A. Humboldt Sexton	3.25
ALLOYS AND THEIR INDUSTRIAL APPLICATION. By E. F. Law	4.50
ALUMINUM PRODUCTION AND ITS INDUSTRIAL USE. By Adolphe Minet	2.50
METHODS OF CHEMICAL ANALYSIS AND FOUNDRY CHEMISTRY. By Frank L. Crobaugh	2.00
THE BLAST FURNACE AND THE MANUFACTURE OF PIG IRON. By Robert Forsythe	3.00
BRASS FOUNDERS' ALLOYS. By John F. Buchanan	2.00
CAST IRON. By Wm. J. Keep	2.50
METALLURGY OF CAST IRON. By Thos. D. West	3.00
HOW TO MAKE CONVERTER STEEL CASTINGS. By Arthur Simonson	.75
THE CUPOLA FURNACE. By Edward Kirk	3.50
FOUNDRY PRACTICE. By R. H. Palmer	2.00
FOUNDRY WORK. By W. C. Stimpson	1.50
IRON AND STEEL (Encyclopedia) By Hugh Tiemann	3.00
IRON, STEEL AND OTHER ALLOYS. By Henry M. Howe	5.00
THE METALLOGRAPHY OF IRON AND STEEL. By Albert Sauveur	6.00
THE METALLURGY OF IRON AND STEEL. By Bradley Stoughton	3.00
PATTERN MAKING. By James Ritchey	1.50
PENTON'S FOUNDRY LIST. (A. U. S. and Canadian Foundry Directory)	10.00
THE PRODUCTION OF MALLEABLE CASTINGS. By Richard Moldenke	3.00
FOUNDRY DATA SHEETS. (An invaluable foundry manual)	1.50
BLUE BOOK OF AMERICAN SHIPPING. (The Standard American Marine Directory)	5.00
AMERICAN NAUTICAL ALMANAC	.50
USEFUL TABLES. (For the Navigator)	1.25
COURSE FINDER (For the Great Lakes). By Clarence E. Long	2.50
DEVIATION TABLES (For Detroit, St. Clair and St. Marys rivers). By Capt. Anderson	.75
LAKE SHIP YARD METHODS OF STEEL SHIP CONSTRUCTION. By Robert Curr	2.00
GREAT LAKES RED BOOK. (A complete Great Lakes Shipping Directory)	1.00
HON. PETER WHITE. By Ralph D. Williams. (A historical sketch of the development of Lake Superior iron industry)	2.00
TIME AND DISTANCE TABLES FOR GREAT LAKES	1.00
SCOTT'S GREAT LAKES COAST PILOT	2.50
QUESTIONS AND ANSWERS FOR MARINE ENGINEERS. By Theo. Lucas	2.00
THE LAKE SUPERIOR IRON ORE ANNUAL. (Statistical reports of Superior iron ore shipments, 1854-1912 incl.)	2.00
MY DEMON MOTOR BOAT. By Geo. Fitch	1.20
NAVIGATOR'S CHARTS. (Charts for the great lakes, rivers and coasts)	.50

We have other books on Electricity, Engineering, Fuels, etc., about which we would be pleased to furnish information upon request.

REMEMBER

"Any Book on Any Subject" is our Serving Capacity.

PENTON'S BOOK NEWS

CLEVELAND

enay Power & Light Co. has made arrangements to increase the capacity of its power plant at Bonnington Falls by 9,000 horsepower.

SOUTH VANCOUVER.—Reports on the construction of a municipal electric lighting plant and a municipal gas plant have been prepared and the council will shortly take up the matter.

VICTORIA.—The Hudson Bay Co., this place, is receiving bids for the construction and equipment of a 64-foot auxiliary schooner.

VICTORIA.—A $1,500,000 issue of bonds has been voted by the city council for completing the Sooke water-works system.

VICTORIA.—Bids will be received by minister of public works up to Oct. 14 for the superstructure and substructure of bridge over the Kootenay river. J. E. Griffith is public works engineer.

VICTORIA.—Messrs. Cammell, Laird & Co. have been awarded contract by the P. & O. Steamship Co. for two passenger steamers for its Indian trade. They will be of 9,000 tons register, 480 feet long, 58 feet wide and 33 feet deep.

VICTORIA.—A. J. McDonald and the Nettleton, Bruce, Elsback Co. have been awarded a joint contract for the construction of a line of railway from Patricia bay to the entrance to the Songhees reserve terminal at Victoria, about 20 miles of steel.

VICTORIA.—Canadian Northern engineers are making preparations in connection with the extension of the Canadian Northern Pacific for the important steel work which must be built over rivers and ravines. A steel viaduct will be built over the Koksillah river and a steel bridge over the Cowichan river.

VICTORIA.—Details as to the shipbuilding drydock and repairing plant which will be built by the Amalgamated Engineering Co. for North Vancouver show that it will be the largest in Canada. The plans have been approved by the Dominion government. The plant will include a floating drydock, a shipbuilding plant and ship repairing works of the most modern type. The floating dock will have a lifting capacity of 20,000 tons. Electric cranes and modern equipment will be installed in the shops which will be built as an adjunct.

MANITOBA

LE PAS.—Coyle & Hughes, of Winnipeg, have been awarded the contract by the Marconi Telegraph Co. for the erection of a wireless station at $75,000.

SOURIS.—Tenders have been called for an electric light plant for the town. A 24-hour light and power service will be furnished.

WINNIPEG.—The Vulcan Iron Works has been awarded the contract for the steel work on the new $50,000 building for the Adanac Club.

WINNIPEG.—The Linde Canadian Refrigeration Co. has been awarded the contract by the Board of Control for a motor-driven refrigerating plant and refrigerator boxes for the King hospital at $12,470.

WINNIPEG.—The Smart Woods Co., Ltd., has given the general contract for its new warehouse and plant costing $200,000 to G. H. Archibald & Co., Union Bank building. Two freight elevators, fireproof doors, office fixtures, grille work, vaults, boilers, and bag-making machinery will be required.

WINNIPEG.—The Shoal Lake water system for the city of Winnipeg, recently reported on, will cost $13,045,000. From Transcona to Winnipeg five-foot steel pipe will be used with five-foot cast iron pipe under river; four-foot cast iron pipe in tunnel to convey water to reservoirs; concrete aqueduct with capacity of 85,000,000 gallons per day; storage reservoir at Transcona with capacity of 250,000,000 gallons; main pumping station at Transcona to force water through five-foot steel pipe into city. Ten miles of steel pipe will be needed altogether. A by-law will be voted upon Oct. 1.

ONTARIO

CHATHAM.—The Canadian Northern railway, which has secured control of the Chatham, Wallaceburg & Lake Erie Electric railroad, will undertake extensions shortly, it is announced.

HAMILTON.—The Canadian Westinghouse Co. is planning extensive additions to its plant in this city.

HAMILTON.—The Dominion Steel Castings Co. will make an addition to its plant on Depew street to cost $12,000. H. G. Christmann & Co. are general contractors for the structure, which will be of steel and concrete.

LONDON.—During the month of October the ratepayers will be asked to vote on a proposition to electrify the London & Port Stanley railway.

OTTAWA.—The Montreal Harbor Commission will this year start on the construction of two new freight sheds at a cost of $300,000. One will be 106 x 275 feet, two stories, and the other 112 x 485 feet, two stories.

OTTAWA.—Conveying machinery will be required to replace the sawdust conveyor destroyed by fire at the plant of the J. R. Booth Co., Ottawa. A new timber mill will also be built and equipment for it purchased.

OTTAWA.—The Hamilton Bridge Co. has been awarded a contract by the Dominion government for the construction of the double track railway swing bridge over the Welland canal at $65,800.

OTTAWA.—The Federal government is planning the reorganization of the Intercolonial railway. Several sections of the road will be double-tracked, yard and shop facilities increased at various points and a general overhauling of the whole of the property on the system.

PORT COLBORNE.—The Canadian Furnace Co. will within a few weeks commence operations at its new plant recently completed at Port Colborne at a cost of $2,000,000.

PORT HOPE.—At an estimated cost of $10,000 the Seymour Power Co., which has been granted a ten-year franchise, will extend its electric power system.

SARNIA.—The Perfection Stove Co., Ltd., has been incorporated to manufacture and deal in stoves and kitchen utensils; $1,000,000; Messrs. Richard Vryling Le Sueur, Anthony Ignatius McKinley and Norman Lisle Le Sueur and others of Sarnia.

SARNIA.—The Cleveland Foundry Co., Cleveland, has prepared plans for the erection of a plant in this town for the manufacture of oil stoves and cooking utensils, costing about $200,000. The first building erected will be of concrete and steel. Three of them will be 100 x 200 feet. The town granted a fixed assessment of $25,000.

TILBURY TOWNSHIP.—Four bridges are planned for the Township of Tilbury North, J. A. Tremblay, clerk. They will be of concrete and steel construction.

TORONTO.—W. & J. G. Greey, of Church street, Toronto, are making an addition to their foundry to cost $9,000. Tenders may be addressed to Architects G. M. Miller & Co., 93 Yonge street. The addition will be of brick and steel construction.

TORONTO.—The Canadian Pacific railway has completed plans for its freight terminals at Toronto. The buildings will include a solid brick and tseel warehouse, 75 x 500 feet, costing $500,000; freight house for inbound freight, 50 x 900 feet; freight house for outbound freight, 50 x 900 feet; covered transfer platform, 50 x 900 feet; offices, 40 x 185 feet.

WELLAND. — The Canadian Steel Foundries has awarded the Smart-Turner Machine Co., Ltd., of Hamilton, the contract for a centrifugal pump. The corporation of St. Catharines, Ont., has ordered a duplex pump and the Canadian Porcelain Co., of Hamilton, Ont., an automatic feed pump and receivers from the Smart-Turner firm.

QUEBEC

MONTREAL.—Equipment & Supplies, Ltd., has been incorporated to manufacture and deal in water purifying machines and filters, machine refrigerators, etc.; $100,000; by Kenneth Archibald, Harold Blake and Wallace B. Ovey.

MONTREAL.—A new plant for which special machinery will be required, will be erected next year for the American Can Co. in Maissonneuve. The owner will be architect and builder.

PETITE RIVIERE EST.—Tenders will be received until Oct. 7 for the construction of a breakwater. Plans and specifications may be obtained from R. C. Desrochers, secretary of the Public Works Department, Ottawa.

QUEBEC.—The contract for the construction of the Transcontinental railway shops at St. Malo, near here, has been awarded to J. Gosselin, contractor of Levis, P. Q., the cost of the work being $1,500,000.

SASKATCHEWAN

PRINCE ALBERT.—A report on the Prince Albert power development situation presented to the city council shows that it would cost $1,700,000 for the development of 4,000 horsepower.

REGINA.—Tenders will be received until Oct. 25 for the supply of one 3,000-kilowatt steam turbine with condenser; one hand power crane for 45-foot span. Specifications may be obtained from E. W. Bull, superintendent of the light and power department.